

## Chemical Safety Data Sheet MSDS / SDS

## Dimethyl carbonate SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: Dimethyl carbonate

CAS: 616-38-6

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

Relevant identified uses: For R&amp;D use only. Not for medicinal, household or other use.

Uses advised against: none

**Company Identification**

Company: Chemicalbook.in

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

Flammable liquids, Category 2

## GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

### Hazard statement(s)

H225 Highly flammable liquid and vapour

### Precautionary statement(s)

#### Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

#### Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].

P370+P378 In case of fire: Use ... to extinguish.

#### Storage

P403+P235 Store in a well-ventilated place. Keep cool.

#### Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

#### Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

**Substance**

Chemical name:	Dimethyl carbonate
Common names and synonyms:	Dimethyl carbonate
CAS number:	616-38-6
EC number:	210-478-4
Concentration:	100%

**SECTION 4: First aid measures****Description of necessary first-aid measures****If inhaled**

Fresh air, rest.

**Following skin contact**

Rinse and then wash skin with water and soap.

**Following eye contact**

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

**Following ingestion**

Rinse mouth.

**Most important symptoms/effects, acute and delayed**

Excerpt from ERG Guide 129 [Flammable Liquids (Water-Miscible / Noxious)]: May cause toxic effects if inhaled or absorbed through skin. Inhalation or contact with material may irritate or burn skin and eyes. Fire will produce irritating, corrosive and/or toxic gases. Vapors may cause dizziness or suffocation. Runoff from fire control or dilution water may cause pollution. (ERG, 2016)

**Indication of immediate medical attention and special treatment needed, if necessary**

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep

patient quiet and maintain normal body temperature. Obtain medical attention. Esters and related compounds

## SECTION 5: Firefighting measures

### Suitable extinguishing media

Explosion: In case of fire: keep drums, etc., cool by spraying with water.

### Specific hazards arising from the chemical

Excerpt from ERG Guide 129 [Flammable Liquids (Water-Miscible / Noxious)]: HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a (P) may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. (ERG, 2016)

### Special protective actions for fire-fighters

Use water spray, alcohol-resistant foam, dry powder, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

### Environmental precautions

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT wash away into sewer.

### Methods and materials for containment and cleaning up

Use water spray to cool and disperse vapors and protect personnel. Control runoff and isolate discharged material for proper

disposal.

## SECTION 7: Handling and storage

### Precautions for safe handling

NO open flames, NO sparks and NO smoking. NO contact with oxidizing agents. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants. Well closed. Store in an area without drain or sewer access. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Air sensitive.

## SECTION 8: Exposure controls/personal protection

### Control parameters

### Occupational Exposure limit values

no data available

### Biological limit values

no data available

### Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### Individual protection measures, such as personal protective equipment (PPE)

#### Eye/face protection

Wear safety goggles.

#### Skin protection

Protective gloves.

### Respiratory protection

Use ventilation.

### Thermal hazards

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Liquid.
Colour:	Colourless.
Odour:	Pleasant odor
Melting point/freezing point:	4.65 °C. Remarks:Melting point was determined as 4.65°C with a precision of $\pm 0.05^\circ\text{C}$ .
Boiling point or initial boiling point and boiling range:	90.2°C. Atm. press.:101.3 kPa.
Flammability:	Highly flammable.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	16.7 °C. Atm. press.:Ca. 1 013.2 hPa.
Auto-ignition temperature:	458 °C. Remarks:Pressure not stated.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	dynamic viscosity (in mPa s) = 0.585. Temperature:25°C.

Solubility:	139 g / L (20 °C)
Partition coefficient n-octanol/water:	log Pow = 0.354. Temperature:20 °C. Remarks:Information on pH not 100 % clear at this stage, however, the the study was conducted in accordance with OECD TG 107. It is assumed that the pH of the water used in the test was pH-neutral as conformity with the OECD TG is stated in the study report.
Vapour pressure:	7 570.4 Pa. Temperature:25.15°C.
Density and/or relative density:	1.06 g/cm <sup>3</sup> . Temperature:25°C.
Relative vapour density:	3.1 (vs air)
Particle characteristics:	no data available

## SECTION 10: Stability and reactivity

### Reactivity

Reacts violently with oxidants and potassium tert-butoxide. This generates fire hazard. Decomposes on burning. This produces irritating fumes.

### Chemical stability

no data available

### Possibility of hazardous reactions

A very dangerous fire hazard when exposed to heat, open flames (sparks), or oxidizers. The vapour is heavier than air and may travel along the ground; distant ignition possible. The vapour mixes well with air, explosive mixtures are easily formed. DIMETHYL CARBONATE reacts with acids to liberate heat along with methanol and carbon dioxide. Strong oxidizing acids may cause a vigorous reaction that is sufficiently exothermic to ignite the reaction products. Heat is also generated by the interaction with caustic solutions. Flammable hydrogen is generated by mixing with alkali metals and hydrides.

### Conditions to avoid

no data available

### Incompatible materials

Vapor/air mixtures are explosive.

#### **Hazardous decomposition products**

When heated to decomposition it emits acrid smoke and irritating fumes.

### **SECTION 11: Toxicological information**

#### **Acute toxicity**

Oral: LD50 - rat (male/female) - > 5 000 mg/kg bw.

Inhalation: LC50 - rat (male/female) - > 5.36 mg/L air (analytical).

Dermal: LD50 - rabbit (male/female) - > 2 000 mg/kg bw.

#### **Skin corrosion/irritation**

no data available

#### **Serious eye damage/irritation**

no data available

#### **Respiratory or skin sensitization**

no data available

#### **Germ cell mutagenicity**

no data available

#### **Carcinogenicity**

no data available

#### **Reproductive toxicity**

no data available



### **STOT-single exposure**

The vapour is mildly irritating to the eyes.

### **STOT-repeated exposure**

no data available

### **Aspiration hazard**

no data available

## **SECTION 12: Ecological information**

### **Toxicity**

Toxicity to fish: LC50 - Danio rerio (previous name: Brachydanio rerio) -  $\geq 100$  mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna -  $> 100$  mg/L - 48 h.

Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) -  $> 100$  mg/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage -  $> 1\,000$  mg/L - 3 h.

### **Persistence and degradability**

AEROBIC: Dimethyl carbonate was  $>90\%$  biodegraded in 28 days using an activated sludge inoculum in the OECD 301C test (Modified MTI)(1).

### **Bioaccumulative potential**

An estimated BCF of 3.2 was calculated in fish for dimethyl carbonate(SRC), using an estimated log Kow of 0.23(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

### **Mobility in soil**

Using a structure estimation method based on molecular connectivity indices(1), the Koc of dimethyl carbonate can be estimated to be 2.9 (SRC). According to a classification scheme(2), this estimated Koc value suggests that dimethyl carbonate is expected to have very high mobility in soil.

### Other adverse effects

no data available

## SECTION 13: Disposal considerations

### Disposal methods

#### Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

## SECTION 14: Transport information

### UN Number

ADR/RID: UN1161 (For reference only, please check.)

IMDG: UN1161 (For reference only, please check.)

IATA: UN1161 (For reference only, please check.)

### UN Proper Shipping Name

ADR/RID: DIMETHYL CARBONATE (For reference only, please check.)

IMDG: DIMETHYL CARBONATE (For reference only, please check.)

IATA: DIMETHYL CARBONATE (For reference only, please check.)

### Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)

IMDG: 3 (For reference only, please check.)

IATA: 3 (For reference only, please check.)

### Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

#### **Environmental hazards**

ADR/RID: No

IMDG: No

IATA: No

#### **Special precautions for user**

no data available

#### **Transport in bulk according to IMO instruments**

no data available

### **SECTION 15: Regulatory information**

**Safety, health and environmental regulations specific for the product in question**

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

**EC Inventory**

Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

**China Catalog of Hazardous chemicals 2015**

Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Listed.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Listed.

**IECSC)**

Listed.

**Korea Existing Chemicals List (KECL)**

Listed.

## **SECTION 16: Other information**

### **Abbreviations and acronyms**

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### **References**

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

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