

## SECTION 1: Identification

### 1.1 GHS Product identifier

Product name 7-oxa-3-oxiranylbicyclo[4.1.0]heptane

### 1.2 Other means of identification

Product number -

Other names 4-vinylcyclohexene diepoxide; VCHD; 1-epoxyethyl-3,4-epoxycyclohexane

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research uses.

Uses advised against no data available

## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal

Acute toxicity - Category 3, Inhalation

Carcinogenicity, Category 2

### 2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H301 Toxic if swallowed

H311 Toxic in contact with skin

H331 Toxic if inhaled

H351 Suspected of causing cancer

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

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

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

P203 Obtain, read and follow all safety instructions before use.

Response

P301+P316 IF SWALLOWED: Get emergency medical help immediately.

P321 Specific treatment (see ... on this label).

P330 Rinse mouth.

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

P316 Get emergency medical help immediately.

P361+P364 Take off immediately all contaminated clothing and wash it before reuse.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P318 IF exposed or concerned, get medical advice.

Storage

P405 Store locked up.

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

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.

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

no data available

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
7-oxa-3-oxiranylbicyclo[4.1.0]heptane	7-oxa-3-oxiranylbicyclo[4.1.0]heptane	106-87-6	203-437-7	100%

## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention.

#### **Following skin contact**

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

#### **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. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention .

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

Exposure Routes: inhalation, skin absorption, ingestion, skin and/or eye contact Target Organs: Eyes, skin, respiratory system, blood, thymus, reproductive system (NIOSH, 2016)

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

#### **Absorption, Distribution and Excretion**

4-Vinyl-1-cyclohexene diepoxide is absorbed by rodents exposed dermally orally, or by inhalation. ... Rats and mice received 0.1 ml and 0.01 ml, respectively, of dose mixtures containing 500 mg/ml (200 µg/ml) [ethylene-(14)C] 4-vinyl-1-cyclohexene diepoxide in acetone. The preliminary results indicate that 30% of the dose applied to the skin is absorbed over a 24 hr period for both rats and mice; only 1%-3% of the dose remained on the skin at the site of application. By 24 hr, 70%-80% of the absorbed dose had been eliminated from the body, virtually all in the urine. The radioactivity remaining in the body was distributed over a number of tissues, with no tissue containing more than 1% of the applied dose. The liver, muscle, and adipose tissue, however, contained 0.5%-1.6% and 1.2%-2.9% of the absorbed dose in rat and mouse tissue, respectively. Tissue to blood ratios ranged from 0.3 to 1.5 in rats and from 0.8 to 2.8 in mice.

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## **SECTION 5: Fire-fighting measures**

### **5.1 Suitable extinguishing media**

To fight fire: Water, foam, dry chemical.

### **5.2 Specific hazards arising from the chemical**

This chemical is combustible. (NTP, 1992)

### **5.3 Special protective actions for fire-fighters**

Use water spray, powder, alcohol-resistant foam, carbon dioxide.

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

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

Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking liquid in sealable containers. Wash away remainder with plenty of water.

### **6.2 Environmental precautions**

Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Collect leaking liquid in sealable containers. Wash away remainder with plenty of water.

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

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

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## **SECTION 7: Handling and storage**

### **7.1 Precautions for safe handling**

NO open flames. 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.

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

Separated from food and feedstuffs, alcohols, amines and other active hydrogen compounds. Dry. Ventilation along the floor.

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## **SECTION 8: Exposure controls/personal protection**

### **8.1 Control parameters**

#### **Occupational Exposure limit values**

TLV: 0.1 ppm as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans). MAK: skin absorption (H); carcinogen category: 2

#### **Biological limit values**

no data available

### **8.2 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.

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

#### Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

#### Skin protection

Protective gloves. Protective clothing.

#### Respiratory protection

Use ventilation, local exhaust or breathing protection.

#### Thermal hazards

no data available

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

<b>Physical state</b>	PHYSICAL DESCRIPTION: Clear colorless liquid. Sets to glass at -67°F. Faint olefinic odor. (NTP, 1992)
<b>Colour</b>	COLORLESS LIQUID
<b>Odour</b>	no data available
<b>Melting point/freezing point</b>	-109°C
<b>Boiling point or initial boiling point and boiling range</b>	227°C at 760mmHg
<b>Flammability</b>	Class IIIB Combustible Liquid: FLP. at or above 200°F.
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	86.4°C
<b>Auto-ignition temperature</b>	393°C
<b>Decomposition temperature</b>	no data available
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	7.77 CP @ 20 DEG C
<b>Solubility</b>	50 to 100 mg/mL at 72°F (NTP, 1992)
<b>Partition coefficient n-octanol/water</b>	1.3
<b>Vapour pressure</b>	0.119mmHg at 25°C
<b>Density and/or relative density</b>	1.227g/cm <sup>3</sup>
<b>Relative vapour density</b>	4.07 (NTP, 1992) (Relative to Air)
<b>Particle characteristics</b>	no data available

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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

NIOSH considers vinyl cyclohexene to be a potential occupational carcinogen.

The substance polymerizes with acids and bases. This generates fire or explosion hazard. On combustion, forms acrid smoke and irritating fumes. Reacts with active hydrogen compounds such as alcohols and amines.

### 10.2 Chemical stability

Slowly hydrolyzed in water

### 10.3 Possibility of hazardous reactions

Slight, when exposed to heat or flame. 1-VINYL-3-CYCLOHEXENE DIOXIDE reacts with active hydrogen compounds (such as alcohols and amines). (NTP, 1992). Epoxides are highly reactive. They polymerize in the presence of catalysts or when heated. These polymerization reactions can be violent. Compounds in this group react with acids, bases, and oxidizing and reducing agents. They react, possibly violently with water in the presence of acid and other catalysts.

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Alcohols, amines, water [Note: Slowly hydrolyzes in water].

### 10.6 Hazardous decomposition products

no data available

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## SECTION 11: Toxicological information

#### Acute toxicity

- Oral: LD50 Rat oral 2.8 g/kg

- Inhalation: LC50 Rat oral inhalation 800 ppm/4 hr
- Dermal: no data available

**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**

Evaluation: There is inadequate evidence in humans for the carcinogenicity of 4-vinylcyclohexene diepoxide. There is sufficient evidence in experimental animals for the carcinogenicity of 4-vinylcyclohexene diepoxide. Overall evaluation: 4-Vinylcyclohexene diepoxide is possibly carcinogenic to humans (Group 2B).

**Reproductive toxicity**

no data available

**STOT-single exposure**

The substance is irritating to the eyes, skin and respiratory tract. Inhalation may cause lung oedema. Exposure at high levels could cause death. The effects may be delayed. Medical observation is indicated. See Notes.

**STOT-repeated exposure**

The substance may have effects on the kidneys, ovary and testes. This may result in tissue lesions. This substance is possibly carcinogenic to humans. Animal tests show that this substance possibly causes toxic effects upon human reproduction.

**Aspiration hazard**

A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20Å°C.

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**SECTION 12: Ecological information****12.1 Toxicity**

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

**12.2 Persistence and degradability**

no data available

**12.3 Bioaccumulative potential**

no data available

**12.4 Mobility in soil**

no data available

**12.5 Other adverse effects**

no data available

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**SECTION 13: Disposal considerations****13.1 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.

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**SECTION 14: Transport information****14.1 UN Number**

ADR/RID: UN2810 (For reference only, please check.) IMDG: UN2810 (For reference only, please check.) IATA: UN2810 (For reference only, please check.)

## 14.2 UN Proper Shipping Name

ADR/RID: TOXIC LIQUID, ORGANIC, N.O.S. (For reference only, please check.) IMDG: TOXIC LIQUID, ORGANIC, N.O.S. (For reference only, please check.) IATA: TOXIC LIQUID, ORGANIC, N.O.S. (For reference only, please check.)

## 14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.) IMDG: 6.1 (For reference only, please check.) IATA: 6.1 (For reference only, please check.)

## 14.4 Packing group, if applicable

ADR/RID: I (For reference only, please check.) IMDG: I (For reference only, please check.) IATA: I (For reference only, please check.)

## 14.5 Environmental hazards

ADR/RID: No IMDG: No IATA: No

## 14.6 Special precautions for user

no data available

## 14.7 Transport in bulk according to IMO instruments

no data available

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# SECTION 15: Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
7-oxa-3-oxiranylbicyclo[4.1.0]heptane	7-oxa-3-oxiranylbicyclo[4.1.0]heptane	106-87-6	203-437-7
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			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

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# SECTION 16: Other information

### Information on revision

Creation Date July 15, 2019

Revision Date July 15, 2019

### 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/>

**Other Information**

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Immediate administration of an appropriate inhalation therapy by a doctor or a person authorized by him/her, should be considered.