

# Safety data sheet

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BASF Safety data sheet according to the United Nations' Globally Harmonized System (UN GHS)

Date / Revised: 08.01.2024

Version: 3.0

Product: **Dimer**

(ID no. 30564016/SDS\_GEN\_00/EN)

Date of print 03.05.2024

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## 1. Identification

### Product identifier

## Dimer

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

Relevant identified uses: Fuel additive

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

Company:

BASF SE

67056 Ludwigshafen

GERMANY

Operating Division Petrochemicals

Telephone: +49 621 60-42151

E-mail address: sds-petrochemicals@basf.com

### Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

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## 2. Hazards Identification

### Classification of the substance or mixture

According to UN GHS criteria

Asp. Tox. 1

Flam. Liq. 2

Acute Tox. 5 (Inhalation - vapour)

| Skin Irrit. 2

Muta. 1B  
 Carc. 1A  
 Repr. 1B (unborn child)  
 Eye Dam. 1  
 Aquatic Acute 2  
 Aquatic Chronic 2  
 STOT RE (Central nervous system) 2

For the classifications not written out in full in this section the full text can be found in section 16.

## Label elements

### Globally Harmonized System (GHS)

Pictogram:



Signal Word:

Danger

Hazard Statement:

H225	Highly flammable liquid and vapour.
H318	Causes serious eye damage.
H315	Causes skin irritation.
H333	May be harmful if inhaled.
H304	May be fatal if swallowed and enters airways.
H360	May damage the unborn child.
H350	May cause cancer.
H340	May cause genetic defects.
H373	May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Precautionary Statements (Prevention):

P280	Wear protective gloves, protective clothing and eye protection or face protection.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P201	Obtain special instructions before use.
P273	Avoid release to the environment.
P243	Take action to prevent static discharges.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe mist or vapour.
P241	Use explosion-proof electrical, ventilating and lighting equipment.
P233	Keep container tightly closed.
P242	Use non-sparking tools.
P240	Ground and bond container and receiving equipment.
P264	Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):

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P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or physician.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P308 + P313	IF exposed or concerned: Get medical attention.
P391	Collect spillage.
P370 + P378	In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction.
P331	Do NOT induce vomiting.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Storage):

P405	Store locked up.
P403 + P235	Store in a well-ventilated place. Keep cool.

Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.
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Labeling of special preparations (GHS):

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 8 - 21 %, dermal

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 8 - 21 %, oral

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 63 - 86 %, Inhalation - vapour

**Other hazards**

According to UN GHS criteria

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

See section 12 - Results of PBT and vPvB assessment.

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### 3. Composition/Information on Ingredients

**Substances**

Not applicable

**Mixtures**

Chemical nature

Contains: aliphatic hydrocarbons

Hazardous ingredients (GHS)

According to UN GHS criteria

**4-Vinylcyclohexene**

Content (W/W): $\geq 55\%$ - $\leq 65\%$	Asp. Tox. 1
CAS Number: 100-40-3	Flam. Liq. 2
EC-Number: 202-848-9	Skin Corr./Irrit. 2
	Eye Dam./Irrit. 1
	Carc. 2
	Aquatic Acute 2
	Aquatic Chronic 2
	H225, H318, H315, H304, H351, H401, H411

**Toluene**

Content (W/W): $\geq 8\%$ - $\leq 10\%$	Asp. Tox. 1
CAS Number: 108-88-3	Flam. Liq. 2
EC-Number: 203-625-9	Skin Corr./Irrit. 2
INDEX-Number: 601-021-00-3	Repr. 2 (unborn child)
	STOT SE 3 (drowsiness and dizziness)
	STOT RE (Central nervous system) 2
	Aquatic Acute 2
	Aquatic Chronic 3
	H225, H315, H304, H336, H361, H373, H412, H401

**N,N-Dimethylformamide**

Content (W/W): $\geq 3\%$ - $\leq 8\%$	Flam. Liq. 3
CAS Number: 68-12-2	Acute Tox. 4 (Inhalation - vapour)
EC-Number: 200-679-5	Acute Tox. 5 (oral)
INDEX-Number: 616-001-00-X	Repr. 1B (unborn child)
	Acute Tox. 5 (dermal)
	Eye Dam./Irrit. 2A
	H226, H319, H332, H360, H303 + H313

**Buta-1,3-diene**

Content (W/W): $\geq 4\%$ - $\leq 6\%$	Flam. Gas 1A
CAS Number: 106-99-0	Press. Gas Liquef. Gas
EC-Number: 203-450-8	Muta. 1B
INDEX-Number: 601-013-00-X	Carc. 1A
	H280, H220, H350, H340

For the classifications not written out in full in this section the full text can be found in section 16.

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## 4. First-Aid Measures

**Description of first aid measures**

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

On skin contact:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention. Do not induce vomiting due to aspiration hazard.

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

Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11., (Further) symptoms and / or effects are not known so far

Hazards: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11. (Further) symptoms and / or effects are not known so far

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

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

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## **5. Fire-Fighting Measures**

### **Extinguishing media**

Suitable extinguishing media:

dry powder, water spray, carbon dioxide, foam

Unsuitable extinguishing media for safety reasons:

water jet

Additional information:

Use extinguishing measures to suit surroundings.

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

Flammable liquid Cool endangered containers with water-spray. See SDS section 7 - Handling and storage.

### **Advice for fire-fighters**

Special protective equipment:

Wear a self-contained breathing apparatus. Special protective equipment for firefighters

Further information:

Evacuate area of all unnecessary personnel. Fight fire from maximum distance.

Extend fire extinguishing measures to the surroundings. Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

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## 6. Accidental Release Measures

| High risk of slipping due to leakage/spillage of product.

| Release of substance/product can cause fire or explosion. Shut off or stop source of leak. Shut off or stop released substance/product under safe conditions.

| Pack in tightly closed containers for disposal.

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

| Handle in accordance with good industrial hygiene and safety practice.

| Avoid all sources of ignition: heat, sparks, open flame. Use antistatic tools. Avoid contact with the skin, eyes and clothing.

| Take off immediately all contaminated clothing.

### **Environmental precautions**

Discharge into the environment must be avoided.

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

| Pick up with suitable appliance and dispose of. Spills should be contained, solidified, and placed in suitable containers for disposal. Dispose of absorbed material in accordance with regulations.

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## 7. Handling and Storage

### **Precautions for safe handling**

| Handle in accordance with good industrial hygiene and safety practice. Avoid all direct contact with the substance/product. Ensure thorough ventilation of stores and work areas. Change clothes immediately after contamination. Refill and handle product only in closed system.

Protection against fire and explosion:

| Avoid all sources of ignition: heat, sparks, open flame. Ground all transfer equipment properly to prevent electrostatic discharge.

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

Further information on storage conditions: Keep container tightly closed in a cool, well-ventilated place. Avoid all sources of ignition: heat, sparks, open flame.

Storage stability:

Storage temperature: < 50 °C

### **Specific end use(s)**

For the relevant identified use(s) listed in Section 1 the advice mentioned in this section 7 is to be observed.

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## 8. Exposure Controls/Personal Protection

### **Control parameters**

Components with occupational exposure limits

68-12-2: N,N-Dimethylformamide  
100-40-3: 4-Vinylcyclohexene  
106-98-9: But-1-ene  
106-99-0: Buta-1,3-diene  
108-88-3: Toluene  
689-97-4: Butenyne

## Exposure controls

### Personal protective equipment

Respiratory protection:

Breathing protection if gases/vapours are formed. Self-contained breathing apparatus.

Hand protection:

Chemical resistant protective gloves (EN ISO 374-1)

nitrile rubber (NBR) - 0.4 mm coating thickness

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:

Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

Body protection:

Anti-static protective clothing, Body protection must be chosen based on level of activity and exposure.

### General safety and hygiene measures

Avoid inhalation of vapour. Avoid contact with the skin, eyes and clothing. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Handle in accordance with good industrial hygiene and safety practice.

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## 9. Physical and Chemical Properties

### Information on basic physical and chemical properties

Form:	liquid	
Colour:	colourless	
Odour:	aliphatic	
Odour threshold:		
	not determined	
pH value:	9,7 (20 °C)	(ASTM E70)
	moderately soluble	
melting range:	< 0 °C	
Boiling range:	97,0 °C	(ASTM D 86)
Flash point:	10,8 °C	(ASTM D3278)

Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	
Flammability:	Highly flammable.	(other)
Lower explosion limit:	0,9 %(V) (20 °C) For liquids not relevant for classification and labelling.	(ASTM E 681)
Upper explosion limit:	8,80 %(V) (20 °C) For liquids not relevant for classification and labelling.	(ASTM E 681)
Ignition temperature:	265,2 °C	(other)
Vapour pressure:	1,35 kPa (20 °C)	(ASTM D323)
Density:	1,002 g/cm <sup>3</sup> (20 °C) liquid	(ASTM D4052)
Relative density:	1,002 (20 °C)	
Relative vapour density (air):	> 1 (20 °C) Heavier than air.	(estimated)
Solubility in water:	sparingly soluble (20 °C)	(internal method)
Solubility (qualitative) solvent(s):	ether, petroleum spirit readily soluble	
Partitioning coefficient n-octanol/water (log Kow):	< 2,0 (25 °C) The statements are based on the properties of the individual components.	
Self ignition:	not self-igniting	
Thermal decomposition:	Vapours may form explosive mixture with air.	
Viscosity, dynamic:	1,063 mPa.s (20 °C)	(ASTM D 445-97)
Viscosity, kinematic:	1,063 mm <sup>2</sup> /s (20 °C)	(ASTM D445)
Explosion hazard:	not explosive	
Fire promoting properties:	not fire-propagating	

### Other information

pKA:

The substance does not dissociate.

## 10. Stability and Reactivity

### Reactivity

Vapours may form explosive mixture with air.



Corrosion to metals: No corrosive effect on metal.

### **Chemical stability**

The product is stable if stored and handled as prescribed/indicated.

### **Possibility of hazardous reactions**

The product may undergo spontaneous polymerization at high temperatures. Polymerization is exothermic and may cause damage to the container and/or release of thermal decomposition products. Formation of explosive gas/air mixtures.

### **Conditions to avoid**

Avoid all sources of ignition: heat, sparks, open flame. Avoid direct sunlight.

### **Incompatible materials**

Substances to avoid:  
nitrogen oxides, oxidizing agents, atmospheric oxygen

### **Hazardous decomposition products**

:  
No hazardous decomposition products known.

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## **11. Toxicological Information**

### **Information on toxicological effects**

#### Acute toxicity

Assessment of acute toxicity:  
Of low toxicity after short-term inhalation. Virtually nontoxic after a single skin contact. Virtually nontoxic after a single ingestion. The product has not been tested. The statement has been derived from the properties of the individual components.

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 8 - 21 %

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 8 - 21 %

The following percentage of the mixture consists of components(s) with unknown hazards regarding the acute toxicity: 63 - 86 %

#### Irritation

Assessment of irritating effects:  
Irritating to skin. Risk of serious damage to eyes. The product has not been tested. The statement has been derived from the properties of the individual components.

#### Respiratory/Skin sensitization

Assessment of sensitization:

No data available. The chemical structure does not suggest a sensitizing effect.

#### Germ cell mutagenicity

Assessment of mutagenicity:

Capable of causing genetic defects. The product has not been tested. The statement has been derived from the properties of the individual components.

*Information on: Buta-1,3-diene*

*Assessment of mutagenicity:*

*Capable of causing genetic defects.*

#### Carcinogenicity

Assessment of carcinogenicity:

The substance caused cancer in animal studies. The product has not been tested. The statement has been derived from the properties of the individual components.

*Information on: Buta-1,3-diene*

*Assessment of carcinogenicity:*

*The substance caused cancer in animal studies.*

#### Developmental toxicity

*Information on: N,N-Dimethylformamide*

*Assessment of teratogenicity:*

*The substance caused malformations/developmental toxicity in laboratory animals.*

#### Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Repeated inhalation exposure to large quantities may affect certain organs. The product has not been tested. The statement has been derived from the properties of the individual components.

*Information on: Toluene*

*Assessment of repeated dose toxicity:*

*Repeated exposure to large quantities may affect certain organs. Damages the central nerve system. The substance may cause deafness after repeated inhalation.*

#### Aspiration hazard

May be fatal if swallowed and enters airways.

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## 12. Ecological Information

### Toxicity

Assessment of aquatic toxicity:

Acutely toxic for aquatic organisms.

*Information on: 4-Vinylcyclohexene*

*Assessment of aquatic toxicity:*

*Acutely toxic for aquatic organisms. Toxic to aquatic life with long lasting effects.*

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## **Persistence and degradability**

Assessment biodegradation and elimination (H<sub>2</sub>O):

Poorly biodegradable. Literature data.

*Information on: 4-Vinylcyclohexene*

*Assessment biodegradation and elimination (H<sub>2</sub>O):*

*Poorly biodegradable. Literature data.*

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*Information on: 4-Vinylcyclohexene*

*Elimination information:*

*0 % BOD of the ThOD (28 d) (OECD 301C; ISO 9408; 92/69/EWG, C.4-F) (activated sludge)*

*Literature data.*

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Assessment of stability in water:

According to structural properties, hydrolysis is not expected/probable.

## **Bioaccumulative potential**

*Information on: 4-Vinylcyclohexene*

*Bioaccumulation potential:*

*Bioconcentration factor: 83 - 211 (56 d), Cyprinus carpio (OECD Guideline 305 C)*

*Literature data.*

*Bioconcentration factor: 110 - 208 (56 d), Cyprinus carpio (OECD Guideline 305 C)*

*Literature data.*

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## **Mobility in soil**

*Information on: N,N-Dimethylformamide*

*Assessment transport between environmental compartments:*

*Volatility: The substance will not evaporate into the atmosphere from the water surface.*

*Adsorption in soil: Adsorption to solid soil phase is not expected.*

*Information on: Buta-1,3-diene*

*Assessment transport between environmental compartments:*

*Volatility: The substance will rapidly evaporate into the atmosphere from the water surface.*

*Adsorption in soil: Adsorption to solid soil phase is possible.*

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## **Results of PBT and vPvB assessment**

The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative).

## **Other adverse effects**

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The product does not contain substances that are listed in Annex I of Regulation (EC) 2037/2000 on substances that deplete the ozone layer.

### **Additional information**

Other ecotoxicological advice:

Do not discharge product into the environment without control.

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## **13. Disposal Considerations**

### **Waste treatment methods**

Incinerate in suitable incineration plant, observing local authority regulations.

Contaminated packaging:

Transport containers should be completely emptied and returned.

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## **14. Transport Information**

### **Land transport**

ADR

UN number or ID number: UN1993

UN proper shipping name: FLAMMABLE LIQUID, N.O.S. (4-VINYLCYCLOHEXENE, 1,3-BUTADIENE)

Transport hazard class(es): 3, EHSM

Packing group: II

Environmental hazards: yes

Special precautions for user: Tunnel code: D/E  
SP 640 D

RID

UN number or ID number: UN1993

UN proper shipping name: FLAMMABLE LIQUID, N.O.S. (4-VINYLCYCLOHEXENE, 1,3-BUTADIENE)

Transport hazard class(es): 3, EHSM

Packing group: II

Environmental hazards: yes

Special precautions for user: SP 640 D

### **Inland waterway transport**

ADN

UN number or ID number: UN1993

UN proper shipping name: FLAMMABLE LIQUID, N.O.S. (4-VINYLCYCLOHEXENE, 1,3-BUTADIENE)

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Transport hazard class(es): 3, EHSM  
Packing group: II  
Environmental hazards: yes  
Special precautions for user: SP 640 D

#### Transport in inland waterway vessel

Not evaluated

### **Sea transport**

#### IMDG

UN number or ID number: UN 1993  
UN proper shipping name: FLAMMABLE LIQUID, N.O.S. (4-VINYLCYCLOHEXENE, 1,3-BUTADIENE)

Transport hazard class(es): 3, EHSM  
Packing group: II  
Environmental hazards: yes  
Marine pollutant: YES  
Special precautions for user: EmS: F-E; S-E

### **Air transport**

#### IATA/ICAO

UN number or ID number: UN 1993  
UN proper shipping name: FLAMMABLE LIQUID, N.O.S. (4-VINYLCYCLOHEXENE, 1,3-BUTADIENE)

Transport hazard class(es): 3  
Packing group: II  
Environmental hazards: No Mark as dangerous for the environment is needed  
Special precautions for user: None known

### **Maritime transport in bulk according to IMO instruments**

Maritime transport in bulk is not intended.

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## **15. Regulatory Information**

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

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

## 16. Other Information

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
Acute Tox.	Acute toxicity
Skin Irrit.	Skin irritation
Muta.	Germ cell mutagenicity
Carc.	Carcinogenicity
Repr.	Reproductive toxicity
Eye Dam.	Serious eye damage
Aquatic Acute	Hazardous to the aquatic environment - acute
Aquatic Chronic	Hazardous to the aquatic environment - chronic
STOT RE	Specific target organ toxicity — repeated exposure
Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
STOT SE	Specific target organ toxicity — single exposure
Flam. Gas	Flammable gases
Press. Gas	Gases under pressure
H225	Highly flammable liquid and vapour.
H318	Causes serious eye damage.
H315	Causes skin irritation.
H304	May be fatal if swallowed and enters airways.
H351	Suspected of causing cancer.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
H336	May cause drowsiness or dizziness.
H361	Suspected of damaging the unborn child.
H373	May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effects.
H226	Flammable liquid and vapour.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H360	May damage the unborn child.
H303 + H313	May be harmful if swallowed or in contact with skin.
H280	Contains gas under pressure; may explode if heated.
H220	Extremely flammable gas.
H350	May cause cancer.
H340	May cause genetic defects.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.