

## Chemical Safety Data Sheet MSDS / SDS

## Isophorone diisocyanate

Revision Date:2023-08-05 Revision Number:1

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

**Product identifier**

Product name : Isophorone diisocyanate  
CBnumber : CB4130253  
CAS : 4098-71-9  
EINECS Number : 223-861-6  
Synonyms : IPDI,isophorone diisocyanate

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

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.  
Uses advised against : none

**Company Identification**

Company : Chemicalbook  
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing  
Telephone : 400-158-6606

## SECTION 2: Hazards identification

**Classification of the substance or mixture**

Skin irritation, Category 2  
Eye irritation, Category 2  
Skin sensitization, Category 1  
Acute toxicity - Category 3, Inhalation  
Specific target organ toxicity – single exposure, Category 3  
Respiratory sensitization, Category 1  
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

**Label elements****Pictogram(s)**

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Signal word : Danger

**Hazard statement(s)**

H315 Causes skin irritation  
H317 May cause an allergic skin reaction

H319 Causes serious eye irritation

H330 Fatal if inhaled

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

H335 May cause respiratory irritation

H411 Toxic to aquatic life with long lasting effects

#### **Precautionary statement(s)**

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

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

P284 Wear respiratory protection.

P320 Specific treatment is urgent (see ... on this label).

P304+P340 IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing.

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

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P342+P311 IF experiencing respiratory symptoms: call a POISON CENTER or doctor/physician.

P405 Store locked up.

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

#### **Prevention**

P264 Wash ... thoroughly after handling.

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

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

P272 Contaminated work clothing should not be allowed out of the workplace.

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

P284 [In case of inadequate ventilation] wear respiratory protection.

P273 Avoid release to the environment.

#### **Response**

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

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

P332+P317 If skin irritation occurs: Get medical help.

P362+P364 Take off contaminated clothing and wash it before reuse.

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

P333+P317 If skin irritation or rash occurs: Get medical help.

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

P316 Get emergency medical help immediately.

P319 Get medical help if you feel unwell.

P342+P316 If experiencing respiratory symptoms: Get emergency medical help immediately.

P391 Collect spillage.

#### **Storage**

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

P405 Store locked up.

#### **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

no data available

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## SECTION 3: Composition/information on ingredients

### Substance

Product name	: Isophorone diisocyanate
Synonyms	: IPDI, isophorone diisocyanate
CAS	: 4098-71-9
EC number	: 223-861-6
MF	: C <sub>12</sub> H <sub>18</sub> N <sub>2</sub> O <sub>2</sub>
MW	: 222.28

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## SECTION 4: First aid measures

### Description of first aid measures

#### If inhaled

Fresh air, rest. Half-upright position. Refer immediately 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

Rinse with plenty of water (remove contact lenses if easily possible). Refer immediately for medical attention.

#### Following ingestion

Rinse mouth. Do NOT induce vomiting. Give one or two glasses of water to drink. Refer for medical attention .

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

This material is highly toxic by inhalation and moderately toxic through the skin. (Non-Specific -- Isocyanates) People with skin or respiratory problems should avoid exposure. (EPA, 1998)

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

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. Isocyanates, aliphatic thiocyanates, and related compounds

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## SECTION 5: Firefighting measures

### Extinguishing media

If material on fire or involved in fire: Do not extinguish fire unless flow can be stopped. Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Use water in flooding quantities as fog. Cool all affected containers with

flooding quantities of water. Apply water from as far a distance as possible. Use foam, dry chemical, or carbon dioxide. Keep run-off water out of sewers and water sources.

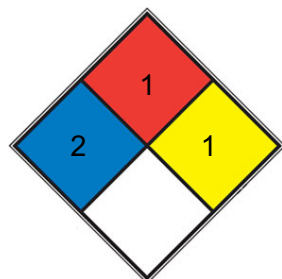
### Specific Hazards Arising from the Chemical

When heated to decomposition, it emits toxic fumes of nitrogen oxides. (EPA, 1998)

### Advice for firefighters

Use water spray, foam, powder, carbon dioxide.

### NFPA 704



HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl ether](#), ammonium phosphate, iodine)

FIRE 1 Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. [mineral oil](#), ammonia)

REACT 1 Normally stable, but can become unstable at elevated temperatures and pressures (e.g. [propene](#))

SPEC.  
 HAZ.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Personal protection: chemical protection suit including self-contained breathing apparatus. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Treat remaining liquid with a mixture of ammonia (4-8%), detergent (2%), and water. Do NOT let this chemical enter the environment.

### Environmental precautions

Personal protection: chemical protection suit including self-contained breathing apparatus. Collect leaking liquid in covered containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Treat remaining liquid with a mixture of ammonia (4-8%), detergent (2%), and water. Do NOT let this chemical enter the environment.

### Methods and materials for containment and cleaning up

Decontamination of spilled isocyanates and disposal of isocyanate waste are best conducted by using aqueous ammonia (3-8% concentrated ammonia solution in 90-95% water with 0.2-5% liquid detergent) or aqueous sodium carbonate (5-10% sodium carbonate in 90-95% water and 0.2-5% liquid detergent). An alcoholic solution (50% ethanol, isopropyl alcohol, or butanol; 45% water; and 5% concentrated ammonia) may

be preferred because of the low miscibility of isocyanates with water. Isocyanates

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## SECTION 7: Handling and storage

### 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.

### Conditions for safe storage, including any incompatibilities

Separated from bases, acids, alcohols, amines, amides, phenols, mercaptans and food and feedstuffs. Keep in a well-ventilated room. Well closed. Cool. Dry. Store in an area without drain or sewer access. Isocyanates are transported in railroad tank cars, tank trucks, tanks in ships, containers, and drums. They are stored in steel tanks and processed in steel equipment. For long-term storage stainless steel is recommended. To avoid contamination by atmospheric moisture, a dry air or inert gas blanket is essential. Isocyanates

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## SECTION 8: Exposure controls/personal protection

### Control parameters

#### Occupational Exposure limit values

TLV: 0.005 ppm as TWA. MAK: 0.046 mg/m<sup>3</sup>, 0.005 ppm; peak limitation category: I(1); sensitization of respiratory tract and skin (SAH); pregnancy risk group: D

#### Biological limit values

no data available

### Exposure 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

#### Eye/face protection

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

#### Skin protection

Protective gloves. Protective clothing.

#### Respiratory protection

Use closed system.

#### Thermal hazards

no data available

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## SECTION 9: Physical and chemical properties

### Information on basic physicochemical properties

Physical state

Liquid

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Colour	Clear colorless to slightly yellow
Odour	Pungent
Melting point/freezing point	-60 °C.
Boiling point or initial boiling point and boiling range	310 °C. Atm. press.:1 013 hPa.
Flammability	Class IIIB Combustible Liquid: Fl.P. at or above 200°F.
Lower and upper explosion limit/flammability limit	0.7-4.5%(V)
Flash point	150.5 °C. Atm. press.:1 013 hPa.
Auto-ignition temperature	430 °C. Atm. press.:Ca. 1 013 hPa.
Decomposition temperature	310°C
pH	no data available
Kinematic viscosity	dynamic viscosity (in mPa s) = 14.2. Temperature:20°C. Remarks:Shear rate 1000/s.;dynamic viscosity (in mPa s) = 7.41. Temperature:40°C. Remarks:Shear rate 1000/s.;dynamic viscosity (in mPa s) = >= 18 - <= 26. Temperature:20°C. Remarks:Shear rate 20/s - 100/s.
Solubility	Miscible with esters, ketones, ethers, and aromatic and aliphatic hydrocarbons.
Partition coefficient n-octanol/water	log Pow = 0.99. Temperature:23 °C. Remarks:PH value is for test water saturated with octanol but without test substance.
Vapour pressure	0.0004 hPa (20 °C)
Density and/or relative density	1 058 kg/m <sup>3</sup> . Temperature:20 °C.
Relative vapour density	no data available
Particle characteristics	no data available

## SECTION 10: Stability and reactivity

### Reactivity

The substance may polymerize. Decomposes on burning. This produces toxic and corrosive fumes including hydrogen cyanide and nitrogen oxides. Reacts with acids, alcohol, amines, bases, amides, phenols and mercaptans. This generates toxic, fire and explosion hazard. Attacks plastics and rubber.

### Chemical stability

no data available

### Possibility of hazardous reactions

A flammable liquid.ISOPHORONE DIISOCYANATE reacts with all substances containing active hydrogen atoms such as water, alcohols, phenols, amines, mercaptans, amides, urethanes and ureas. (NTP, 1992)

### Conditions to avoid

no data available

### Incompatible materials

Reacts with all substances containing active hydrogen atoms such as water, alcohols, phenols, amines, mercaptans, amides, urethanes, and ureas.

## Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides and hydrogen cyanide/.

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## SECTION 11: Toxicological information

### Acute toxicity

- Oral: LD50 Rat oral greater than 1000 mg/kg
- Inhalation: LC50 Rat inhalation 123 mg/cu m/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

no data available

### Reproductive toxicity

no data available

### STOT-single exposure

The substance is corrosive to the skin. The substance is severely irritating to the eyes. The aerosol is irritating to the respiratory tract.

### STOT-repeated exposure

Repeated or prolonged contact may cause skin sensitization. Repeated or prolonged inhalation may cause asthma. See Notes.

### Aspiration hazard

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

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## SECTION 12: Ecological information

### Toxicity

Toxicity to fish: LC50 - Cyprinus carpio - > 208 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - 27 mg/L - 48 h. Remarks:(DOC).

Toxicity to algae: EC50 - Desmodesmus subspicatus (previous name: Scenedesmus subspicatus) - > 70 mg/L - 72 h.

Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage - 263 mg/L - 3 h. Remarks:Respiration rate.

### **Persistence and degradability**

no data available

### **Bioaccumulative potential**

Isocyanates, such as isophorone diisocyanate, are hydrolyzed rapidly by water(1), indicating that bioconcentration is not an important environmental fate process(SRC).

### **Mobility in soil**

Isocyanates, such as isophorone diisocyanate, are hydrolyzed rapidly by water(1), indicating that adsorption is not an important environmental fate process(SRC).

### **Other adverse effects**

no data available

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## 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.

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## SECTION 14: Transport information

### **UN Number**

ADR/RID: UN2478 (For reference only, please check.)

IMDG: UN2478 (For reference only, please check.)

IATA: UN2478 (For reference only, please check.)

### **UN Proper Shipping Name**

ADR/RID: ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S. (For reference only, please check.)

IMDG: ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S. (For reference only, please check.)

IATA: ISOCYANATES, FLAMMABLE, TOXIC, N.O.S. or ISOCYANATE SOLUTION, FLAMMABLE, TOXIC, N.O.S. (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: Yes

IMDG: Yes

IATA: Yes

### **Special precautions for user**

no data available

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

no data available

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## 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.

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## 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?pagelD=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pagelD=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

Anyone who has shown symptoms of asthma due to this substance should avoid all further contact. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT take working clothes home.

#### Disclaimer:

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.