



# SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0  
Creation Date: July 15, 2019  
Revision Date: July 15, 2019

## SECTION 1: Identification

### 1.1 GHS Product identifier

**Product name** cis-1,4-dichlorobut-2-ene

### 1.2 Other means of identification

**Product number** -

**Other names** cis-1,4-Dichloro-2-butene; 2-Butene, 1,4-dichloro-, (Z)-; cis-1,4-Dichloro-2-butene, AcroSeal

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

**Identified uses** Industrial and scientific research use.

**Uses advised against** no data available

### 1.4 Supplier's details

**Company** Shanghai Yien Chemical Technology Co., Ltd  
**Address** Building 6, 28 Yingong Road, Fengxian District, Shanghai  
Chemical Industry Zone, Shanghai, 201400, China  
**Telephone** +86-400-133-2688

### 1.5 Emergency phone number

**Emergency phone number** +86-400-133-2688

**Service hours** Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Flammable liquids, Category 3  
Acute toxicity - Category 3, Oral  
Acute toxicity - Category 3, Dermal  
Skin corrosion, Sub-category 1B  
Acute toxicity - Category 2, Inhalation  
Carcinogenicity, Category 1B  
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

### 2.2 GHS label elements, including precautionary statements

**Pictogram(s)**





|                                   |   |
|-----------------------------------|---|
| <b>Signal word</b>                | Danger  |
| <b>Hazard statement(s)</b>        | H226 Flammable liquid and vapour<br>H301 Toxic if swallowed<br>H311 Toxic in contact with skin<br>H314 Causes severe skin burns and eye damage<br>H330 Fatal if inhaled<br>H350 May cause cancer<br>H400 Very toxic to aquatic life   |
| <b>Precautionary statement(s)</b> |   |
| <b>Prevention</b>                 | P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.<br>P233 Keep container tightly closed.<br>P240 Ground and bond container and receiving equipment.<br>P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.<br>P242 Use non-sparking tools.<br>P243 Take action to prevent static discharges.<br>P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...<br>P264 Wash ... thoroughly after handling.<br>P270 Do not eat, drink or smoke when using this product.<br>P260 Do not breathe dust/fume/gas/mist/vapours/spray.<br>P271 Use only outdoors or in a well-ventilated area.<br>P284 [In case of inadequate ventilation] wear respiratory protection.<br>P203 Obtain, read and follow all safety instructions before use.<br>P273 Avoid release to the environment.   |
| <b>Response</b>                   | P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].<br>P370+P378 In case of fire: Use ... to extinguish.<br>P301+P316 IF SWALLOWED: Get emergency medical help immediately.<br>P321 Specific treatment (see ... on this label).<br>P330 Rinse mouth.<br>P302+P352 IF ON SKIN: Wash with plenty of water/...<br>P316 Get emergency medical help immediately.<br>P361+P364 Take off immediately all contaminated clothing and wash it before reuse.<br>P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.<br>P363 Wash contaminated clothing before reuse.<br>P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.<br>P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>P320 Specific treatment is urgent (see ... on this label).<br>P318 IF exposed or concerned, get medical advice.<br>P391 Collect spillage. |
| <b>Storage</b>                    | P403+P235 Store in a well-ventilated place. Keep cool.<br>P405 Store locked up.<br>P403+P233 Store in a well-ventilated place. Keep container tightly closed.   |
| <b>Disposal</b>                   | 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

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## SECTION 3: Composition/information on ingredients

### 3.1 Substances

| Chemical name             | Common names and synonyms | CAS number | EC number | Concentration |
|---------------------------|---------------------------|------------|-----------|---------------|
| cis-1,4-dichlorobut-2-ene | cis-1,4-dichlorobut-2-ene | 1476-11-5  | 216-021-5 | 100%          |

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## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

#### If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

#### Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

#### Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

#### Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

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

Inhalation of vapor irritates nose and throat. Contact with eyes causes intense irritation and tears. Contact of liquid with skin causes severe blistering and dermatitis. Ingestion causes severe irritation of mouth and stomach. (USCG, 1999)

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

Stabilization: Treatment is largely supportive. Watch for respiratory depression & arrhythmias. Obtain arterial blood gases. Administer oxygen if there is evidence of altered mental status or dyspnea. Treat hypotension with volume expansion & vasopressor. Use lidocaine or beta-blockers for ventricular arrhythmias. Skin: Remove contaminated clothing. Wash affected area with soap & copious amounts of water. Eye: Irrigate the eye for 15-20 min. Obtain a consultation if symptoms persist. Oral: Most of the halogenated solvents ingested in quantities of 1-2 swallows may be partially removed by ipecac-induced emesis if admin within a few hr to a patient who has not lost the gag reflex, is not seizing, is not markedly lethargic, or is not in coma. Observe the patient in the upright position to lessen the possibility of aspiration. Activated charcoal is probably ineffective. Inhalation: Move from the contaminated area. Provide a source of oxygen & prepare for mechanical ventilation. If the patient is unconscious & the pulse is absent, initiate CPR measures. Enhancement of Elimination: Maintain good ventilation. Hemodialysis or hemoperfusion are not likely to be useful because of the high lipophilic properties of these solvents. Antidote: N-acetylcysteine may restore depleted glutathione stores, but no adequate clinical studies are available to validate this possible treatment. Supportive Care: Watch for cardiac dysrhythmias, aspiration pneumonitis, hepatotoxicity, & hypoxic encephalopathy. Monitor for arrhythmia for at least 24 hr & for hepatorenal failure for about 3 days. Obtain a chest x-ray, arterial blood gas, EKG, serum creatinine, & hepatic aminotransferase. Check electrolyte imbalance daily. Treat renal failure with dialysis & hepatic failure with fresh frozen plasma, vitamin K, a low-protein diet, neomycin, & lactulose. Watch fluid & electrolyte balance. Halogenated hydrocarbons

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## SECTION 5: Fire-fighting measures

### 5.1 Suitable extinguishing media

If material on fire or involved in fire: 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. Solid streams of water may be ineffective. Use foam, dry chemical, or carbon dioxide. Use water spray to knock-down vapors. Dichlorobutene

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

Special Hazards of Combustion Products: Decomposition vapors contain phosgene and hydrogen chloride gases; both are toxic and irritating. (USCG, 1999)

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

Wear self-contained breathing apparatus for firefighting if necessary.

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# **SECTION 6: Accidental release measures**

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

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

## **6.2 Environmental precautions**

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

## **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**

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**

Storage temperature: Ambient with open venting and equipped with a flame arrester. Dichlorobutene

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

## **8.1 Control parameters**

### **Occupational Exposure limit values**

no data available

### **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 tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

#### **Skin protection**

Wear fire/flammable resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

#### **Respiratory protection**

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

#### **Thermal hazards**

no data available

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

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|---|--|
| <b>Physical state</b>   | 1,4-dichloro-2-butene is a clear colorless liquid. Burns, though may be difficult to ignite. Corrosive to tissue. Denser than water and insoluble in water. Vapors heavier than air. Used to make other chemicals. |
| <b>Colour</b>   | COLORLESS LIQUID   |
| <b>Odour</b>  | DISTINCT ODOR  |
| <b>Melting point/freezing point</b>                             | -48°C  |
| <b>Boiling point or initial boiling point and boiling range</b> | 152°C  |
| <b>Flammability</b>   | no data available  |
| <b>Lower and upper explosion limit/flammability limit</b>       | 1.5-4% /Dichlorobutene/  |
| <b>Flash point</b>  | 56°C   |
| <b>Auto-ignition temperature</b>                                | 55 deg C   |
| <b>Decomposition temperature</b>                                | no data available  |
| <b>pH</b>   | no data available  |
| <b>Kinematic viscosity</b>                                      | 1.293X10 <sup>-3</sup> Pa-sec @ melting point  |
| <b>Solubility</b>   | Sol in alcohol, ether, acetone, benzene  |
| <b>Partition coefficient n-octanol/water</b>                    | no data available  |
| <b>Vapour pressure</b>  | 3.43 mm Hg @ 25 deg C  |
| <b>Density and/or relative density</b>                          | 1.188  |
| <b>Relative vapour density</b>                                  | no data available  |
| <b>Particle characteristics</b>                                 | no data available  |

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## **SECTION 10: Stability and reactivity**

### **10.1 Reactivity**

Highly flammable. Reacts slowly with water to form hydrochloric acid. Insoluble in water.

### **10.2 Chemical stability**

Reacts slowly with water to form hydrochloric acid. Dichlorobutene

### **10.3 Possibility of hazardous reactions**

Flammable /Dichlorobutene/Halogenated unsaturated aliphatic compounds, such as 1,4-DICHLORO-2-BUTENE, are moderately or very reactive. Halogenated organics generally become less reactive as more of their hydrogen atoms are replaced with halogen atoms. Low molecular weight haloalkanes are highly flammable and can react with some metals to

form dangerous products. Materials in this group are incompatible with strong oxidizing and reducing agents. Also, they are incompatible with many amines, nitrides, azo/diazo compounds, alkali metals, and epoxides.

#### **10.4 Conditions to avoid**

no data available

#### **10.5 Incompatible materials**

Reacts slowly with water to form hydrochloric acid. Dichlorobutene

#### **10.6 Hazardous decomposition products**

When heated to decomposition it emits toxic fumes of /hydrogen chloride/.

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

#### **Acute toxicity**

- Oral: LD50 Rat oral 89 mg/kg
- Inhalation: LC50 Rat inhalation 86 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**

A2: Suspected human carcinogen. 1,4-Dichloro-2-butene

#### **Reproductive toxicity**

no data available

#### **STOT-single exposure**

no data available

#### **STOT-repeated exposure**

no data available

#### **Aspiration hazard**

no data available

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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**

Soil degradation studies conducted with 1,4-dichloro-2-butene (cis-isomer) over a one week incubation period in a sandy loam and silt loam soils found degradation half-lives of

1.8 to 2.5 days in both sterile and non-sterile soils(1); degradation rates in non-sterile soils were not significantly faster than in sterile soils indicating that abiotic or evaporative processes were more important than biological processes for 1,4-dichloro-2-butene(1,2); similar results for the trans-isomer are expected because of the similar structure(SRC).

### 12.3 Bioaccumulative potential

An estimated BCF of 14 was calculated for 1,4-dichloro-trans-2-butene(SRC), using a water solubility of 850 mg/l(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).

### 12.4 Mobility in soil

Using sandy loam and silt loam soils, the Koc of 1,4-dichloro-2-butene (cis-isomer) was experimentally determined to be 215(1). According to a suggested classification scheme(2), this Koc value suggests that 1,4-dichloro-trans-2-butene will have moderate mobility in soil because of the similar structure(SRC).

### 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: UN3390 (For reference only, please check.)

IMDG: UN3390 (For reference only, please check.)

IATA: UN3390 (For reference only, please check.)

### 14.2 UN Proper Shipping Name

ADR/RID: TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC50 lower than or equal to 1000 ml/m3 and saturated vapour concentration greater than or equal to 10 LC50 (For reference only, please check.)

IMDG: TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC50 lower than or equal to 1000 ml/m3 and saturated vapour concentration greater than or equal to 10 LC50 (For reference only, please check.)

IATA: TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. with an LC50 lower than or equal to 1000 ml/m3 and saturated vapour concentration greater than or equal to 10 LC50 (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: Yes

IMDG: Yes

IATA: Yes

## 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   |
|--|---------------------------|------------|-------------|
| cis-1,4-dichlorobut-2-ene  | cis-1,4-dichlorobut-2-ene | 1476-11-5  | 216-021-5   |
| 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)       |                           |            | Not Listed. |
| Vietnam National Chemical Inventory                                      |                           |            | Not Listed. |
| Chinese Chemical Inventory of Existing Chemical Substances (China IECSC) |                           |            | Not Listed. |
| Korea Existing Chemicals List (KECL)                                     |                           |            | Not 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/>

**Any questions regarding this SDS, Please send your inquiry to [sds@xixisys.com](mailto:sds@xixisys.com)**

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