

# 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** 2,2,2-trichloroethane-1,1-diol

### 1.2 Other means of identification

**Product number** -  
**Other names** Trichloroacetaldehyde Hydrate; trichloroacetaldehyde monohydrate; Dormal

### 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 Baishun Biotechnology Co., Ltd  
**Address** No. 26, Lane 918, Lianye Road, Zhelin Town, Fengxian District, Shanghai, 201400, China  
**Telephone** +86-21-37581181

### 1.5 Emergency phone number

**Emergency phone number** +86-21-37581181  
**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

Acute toxicity - Category 3, Oral  
Skin irritation, Category 2  
Eye irritation, Category 2

### 2.2 GHS label elements, including precautionary statements

**Pictogram(s)**



**Signal word** Danger  
**Hazard statement(s)** H301 Toxic if swallowed  
H315 Causes skin irritation  
H319 Causes serious eye irritation

**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/...

**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/...  
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.

**Storage**

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.

**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
2,2,2-trichloroethane-1,1-diol	2,2,2-trichloroethane-1,1-diol	302-17-0	206-117-5	100%

---

**SECTION 4: First-aid measures****4.1 Description of necessary first-aid measures****If inhaled**

Fresh air, rest. Artificial respiration may be needed. Refer immediately for medical attention.

**Following skin contact**

Rinse skin with plenty of water or shower.

**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. Do NOT induce vomiting. Refer immediately for medical attention.

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

**SYMPTOMS:** Symptoms of exposure to this compound include general anesthesia, cardiac arrhythmias and blood pressure depression. Other symptoms include hemorrhagic gastritis, enteritis, central nervous system depression, coma, severe respiratory depression, ventricular tachycardia and cardiac arrest. Dermatitis, swelling of the lids, hyperemia, edema of the conjunctiva and a sensation of irritation and tearing may also occur. Exposure may result in gastric irritation, rapid circulatory collapse, kidney and liver damage, heart damage, psychosis and leukopenia. Flatulence, abdominal distension, nausea, headache, giddiness, rashes and blood dyscrasias can occur. **ACUTE/CHRONIC HAZARDS:** This compound is an irritant of the skin and eyes. When heated to decomposition it emits toxic fumes of chlorine. (NTP, 1992)

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

Maintain an open airway and assist ventilation if necessary. Administer supplemental oxygen. Treat coma, hypothermia, hypotension, and pulmonary edema if they occur. Monitor patients for at least 6 hours after ingestion, because delayed absorption may occur. Patients with chloral hydrate ingestion should be monitored 18 to 24 hours because of the risk of cardiac arrhythmias. Tachyarrhythmias caused by myocardial sensitization may be treated with propranolol or esmolol. ... Administer activated charcoal orally if conditions are appropriate. Gastric lavage is not necessary after small to moderate ingestions if activated charcoal can be given promptly. ... Sedative-Hypnotic Agents

---

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

### **5.1 Suitable extinguishing media**

Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. (NTP, 1992)

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

Flash point data for this chemical are not available; however, it is probably combustible. (NTP, 1992)

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

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water.

---

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

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

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

### **6.2 Environmental precautions**

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

### **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.

---

## **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**

Separated from strong bases and food and feedstuffs. Chloral hydrate oral solution should be stored in tight, light-resistant containers. Chloral hydrate capsules should be stored at 15-30 deg C.

---

## **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 safety spectacles or eye protection in combination with breathing protection if powder.

**Skin protection**

Protective gloves.

**Respiratory protection**

Use local exhaust or breathing protection.

**Thermal hazards**

no data available

---

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

<b>Physical state</b>	Solid. Crystalline.
<b>Colour</b>	White.
<b>Odour</b>	Aromatic, penetrating and slightly acrid odor
<b>Melting point/freezing point</b>	55.3 °C. Atm. press.:973.8 hPa.
<b>Boiling point or initial boiling point and boiling range</b>	100.66 °C. Atm. press.:973.8 hPa.
<b>Flammability</b>	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	75 °C. Atm. press.:973.4 hPa.
<b>Auto-ignition temperature</b>	no data available
<b>Decomposition temperature</b>	97°C
<b>pH</b>	5. Remarks:Concentration details not available. 1% w/v aqueous solution of test substance was prepared for estimation of pH.
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	greater than or equal to 10 mg/mL at 68.9° F (NTP, 1992)
<b>Partition coefficient n-octanol/water</b>	log Pow = 1.092. Temperature:25. Remarks:PH details not available.
<b>Vapour pressure</b>	1 999.83 Pa. Temperature:25 °C.
<b>Density and/or relative density</b>	0.947 g/cm <sup>3</sup> . Temperature:28.9 °C.;0.967 g/cm <sup>3</sup> . Temperature:28.9 °C.
<b>Relative vapour density</b>	5.1 (Air= 1)
<b>Particle characteristics</b>	no data available

---

**SECTION 10: Stability and reactivity**

## 10.1 Reactivity

Decomposes on heating. This produces toxic and corrosive fumes including hydrogen chloride. Reacts with strong bases. This produces chloroform.

## 10.2 Chemical stability

Slowly volatilizes on exposure to air.

## 10.3 Possibility of hazardous reactions

Combustible when exposed to heat or flame. CHLORAL HYDRATE is incompatible with alkalis, alkaline earth metals, alkali carbonates and soluble barbiturates. It is decomposed by sodium hydroxide. It reduces ammoniacal silver nitrate. It liquefies when triturated with an equal quantity of menthol, camphor or thymol. (NTP, 1992). Reaction of chloral hydrate with hydroxylamine produces toxic hydrogen cyanide gas, Org. Synth., 1941, Vol. 1, 377.

## 10.4 Conditions to avoid

no data available

## 10.5 Incompatible materials

no data available

## 10.6 Hazardous decomposition products

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

---

# SECTION 11: Toxicological information

### Acute toxicity

- Oral: LD50 - mouse (female) - 1 265 mg/kg bw.
- Inhalation: LC50 - mouse - 100 ppm.
- 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

WEIGHT-OF-EVIDENCE CHARACTERIZATION: Under the 1986 cancer guidelines (EPA), chloral hydrate is assigned to Group C, possible human carcinogen. Under the 1996 proposed guidelines (EPA) for carcinogen risk assessment, chloral hydrate shows suggestive evidence of human carcinogenicity by the oral route of exposure. There are no carcinogenicity data from humans. Two bioassays in rats in which chloral hydrate was administered by drinking water show no increase in tumors at any site. Because only minimal toxicity was observed in the livers of the rats in these bioassays, the tests were not conducted at the maximum tolerated dose. A chronic bioassay in female mice showed a slight increase in the severity grade of hyperplasia and a slight increase in the incidence of adenoma in the pituitary gland pars distalis at the highest exposure tested. There is some evidence that chloral hydrate causes hepatocellular tumors in male mice. An earlier study showing an increase of hepatocellular adenomas or trabecular carcinomas following a single bolus exposure could not be confirmed in a study using more animals and higher exposures. Three separate 2-year bioassays in male mice show an increased incidence of hepatocellular adenoma or carcinoma. There are no data identifying a lesion that is a precursor to the hepatocellular tumors. The strain of mice used has a very high

spontaneous incidence of hepatocellular tumors. Two of the metabolites of chloral hydrate, trichloroacetic acid and dichloroacetic acid, have been shown to cause hepatocellular tumors in rodents. Trichloroacetic acid causes hepatocellular tumors only in mice. Dichloroacetic acid causes hepatocellular tumors in both rats and mice. There is an extensive database on genetic toxicity. A variety of results show that chloral hydrate is a weak gene mutagen and clastogen. Chloral hydrate induces aneuploidy in a wide variety of cell types. These latter effects are thought to arise by disruption of the spindle apparatus. A high concentration of chloral hydrate is required to cause observable effects. Although these data suggest that genotoxicity may play a role in the toxicity of chloral hydrate, the data indicate that these effects require concentrations that are unlikely to occur under physiological conditions at the exposures typically encountered from the environment. Collectively, these data provide suggestive evidence of carcinogenicity, but the weight of evidence is not sufficient to conduct a risk assessment assuming a linear response at low exposure. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: Limited.

#### **Reproductive toxicity**

no data available

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

The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system. This may result in disorientation, lowering of blood pressure and lowering of consciousness. Exposure at high levels could cause cardiac dysrhythmia and unconsciousness or death.

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

The substance may have effects on the liver. This may result in addiction, behavioural effects and liver impairment. This substance is probably carcinogenic to humans. May cause heritable genetic damage to human germ cells.

#### **Aspiration hazard**

A harmful contamination of the air will be reached rather slowly on evaporation of this substance at 20°C.

---

## **SECTION 12: Ecological information**

### **12.1 Toxicity**

- Toxicity to fish: LC50 - Danio rerio (previous name: Brachydanio rerio) - > 100 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - > 98 mg/L - 48 h.
- Toxicity to algae: EC50 - Chlorella vulgaris - > 200 mg/L - 72 h.
- Toxicity to microorganisms: EC0 - Entosiphon sulcatum - < 79 mg/L - 72 h.

### **12.2 Persistence and degradability**

AEROBIC: Biodegradation data for chloral hydrate were not available(1).

### **12.3 Bioaccumulative potential**

An estimated BCF of 3 was calculated in fish for chloral hydrate(SRC), using a log Kow of 0.99(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**

The Koc of chloral hydrate is estimated as 82(SRC), using a log Kow of 0.99(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that chloral hydrate is expected to have high mobility in soil.

### **12.5 Other adverse effects**

no data available

---

## **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.

---

## SECTION 14: Transport information

### 14.1 UN Number

ADR/RID: UN2811 (For reference only, please check.)

IMDG: UN2811 (For reference only, please check.)

IATA: UN2811 (For reference only, please check.)

### 14.2 UN Proper Shipping Name

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

IMDG: TOXIC SOLID, ORGANIC, N.O.S. (For reference only, please check.)

IATA: TOXIC SOLID, 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

---

## 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
2,2,2-trichloroethane-1,1-diol	2,2,2-trichloroethane-1,1-diol	302-17-0	206-117-5
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			Listed.

(PICCS)	
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

## 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

Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is suggested.

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

*Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.*