



# 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** Chlormequat chloride

### 1.2 Other means of identification

**Product number** -  
**Other names** CEKU-CCC;CECECE;choline dichloride

### 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

Acute toxicity - Category 4, Oral  
Acute toxicity - Category 4, Dermal

### 2.2 GHS label elements, including precautionary statements

**Pictogram(s)**



**Signal word** Warning  
**Hazard statement(s)** H302 Harmful if swallowed  
H312 Harmful in contact with skin

**Precautionary statement(s)**  
**Prevention** P264 Wash ... thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.

<b>Response</b>	P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/... P301+P317 IF SWALLOWED: Get medical help. P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P317 Get medical help. P321 Specific treatment (see ... on this label). P362+P364 Take off contaminated clothing and wash it before reuse.
<b>Storage</b>	none
<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
Chlormequat chloride	Chlormequat chloride	999-81-5	213-666-4	100%

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## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

#### If inhaled

Fresh air, rest.

#### 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. Refer for medical attention .

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

Inhalation of spray and prolonged or repeated contact with skin should be avoided. (EPA, 1998)

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

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 if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the 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. Poisons A and B

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## SECTION 5: Fire-fighting measures

### 5.1 Suitable extinguishing media

Non-Specific -- Poisonous Solid, n.o.s.) For small fires, use dry chemical, carbon dioxide, water spray, or foam. For large fires, use water spray, fog, or foam. (EPA, 1998)

## **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.

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# **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. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. 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. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations.

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

Sweep spilled substance into containers. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment. (Extra personal protection: P2 filter respirator for harmful particles).

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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**

Dry. Keep in a well-ventilated room. Store in glass, high-density plastic, rubber or epoxy resin-protected metal containers. Pesticide Storage: Store in original container. DO NOT store below freezing temperatures.

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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 face shield or eye protection in combination with breathing protection.

**Skin protection**

Protective gloves. Protective clothing.

**Respiratory protection**

Use 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>	Chlormequat chloride is a white crystals with a fishlike odor. Used as a plant growth regulator. Said to be effective for cereal grains, tomatoes, and peppers. (EPA, 1998)
<b>Colour</b>	White crystalline solid
<b>Odour</b>	TYPICAL AMINE ODOR
<b>Melting point/freezing point</b>	117°C(lit.)
<b>Boiling point or initial boiling point and boiling range</b>	175°C/27mmHg(lit.)
<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>	46°C(lit.)
<b>Auto-ignition temperature</b>	no data available
<b>Decomposition temperature</b>	245°C
<b>pH</b>	pH = 5.14
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	greater than or equal to 100 mg/mL at 73° F (NTP, 1992)
<b>Partition coefficient n-octanol/water</b>	log Kow = -3.80
<b>Vapour pressure</b>	7.5e-08 mm Hg at 68° F (NTP, 1992)
<b>Density and/or relative density</b>	1.14 to 1.15 g/mL at 20 deg C
<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**

Decomposes on heating. This produces toxic and corrosive fumes including nitrogen oxides and hydrogen chloride. Decomposes on heating with strong aqueous alkali solutions. This produces trimethylamine and other gaseous products. Attacks many metals in the presence of water.

**10.2 Chemical stability**

Stable up to 50 deg C for at least 2 years.

**10.3 Possibility of hazardous reactions**

Noncombustible solid. CHLORMEQUAT CHLORIDE is incompatible with strong oxidizing agents. It is corrosive to unprotected metals. (NTP, 1992) Quaternary ammonium salts often serve as catalysts in reactions. They are incompatible with many strong oxidizers and reducing agents, such as metal hydrides, alkali/active metals, and organometallics.

## 10.4 Conditions to avoid

no data available

## 10.5 Incompatible materials

Should not be combined with dinoseb, cyanazine, or other contact herbicides.

## 10.6 Hazardous decomposition products

The substance decomposes on heating producing toxic and corrosive fumes including nitrogen oxides, hydrogen chloride. The substance decomposes on heating with strong aqueous alkali solutions producing trimethylamine and other gaseous products.

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# SECTION 11: Toxicological information

### Acute toxicity

- Oral: LD50 Rat oral 330-750 mg/kg.
- Inhalation: LC50 Rat inhalation >5.2 mg/l/4 hr
- Dermal: LD50 Rat percutaneous >4000 mg/kg

### 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 aerosol is mildly irritating to the eyes. The substance may cause effects on the nervous system, cholinergic symptoms without acetylcholinesterase inhibition. See Notes.

### STOT-repeated exposure

no data available

### Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

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# SECTION 12: Ecological information

## 12.1 Toxicity

- Toxicity to fish: LC50; Species: *Lepomis macrochirus* (Bluegill, weight 1.5 g); Conditions: freshwater, static, 17 deg C, pH 7.4, hardness 272 mg/L CaCO<sub>3</sub>; Concentration: >100 mg/L for 24 hr /98.1% purity, technical material
- Toxicity to daphnia and other aquatic invertebrates: EC50; Species: *Daphnia magna* (Water flea, age 6-24 hr); Conditions: freshwater, static; Concentration: 16700 ug/L for 48 hr (95% confidence interval: 14900-19200 ug/L); Effect: intoxication, immobilization /100% purity
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

## 12.2 Persistence and degradability

AEROBIC: In soil, chlormequat chloride is rapidly degraded by microbial activity and has no influence on soil microflora or fauna(1). Half-lives in 4 soils were reported as averaging 32 days at 10 deg C and 1 to 28 days at 22 deg C(1). Studies with soil microorganisms indicated that chlormequat chloride breakdown occurred through oxidative processes(2). Chlormequat chloride, at an initial concentration of 282 ppm, biodegraded 18% after running a compost operation consisting of poultry and pig manure for 56 days; the high concentration may have retarded degradation(3). Based on analogy to other quaternary ammonium compounds(4), the reduction of biomass or other nutrient materials in natural water may reduce the biodegradation rate of the chlormequat chloride cation and acclimation enhances biodegradation of quaternary ammonium compounds.

## 12.3 Bioaccumulative potential

An estimated BCF of 3.2 was calculated for chlormequat chloride(SRC), using a log Kow of -3.80(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 chlormequat chloride has been reported to be 203(1). According to a classification scheme(2), this Koc value suggests that chlormequat chloride is expected to have moderate mobility in soil. However, this compound exists as a quaternary ammonium cation and cations generally adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(3). Chlormequat chloride is expected to adsorb strongly to various materials, including suspended solids in wastewater treatment facilities, sediments in rivers and lakes, suspended organics and minerals in natural water systems, clays, proteins, and microorganisms(4-6). Further, adsorption of quaternary ammonium compounds to river sediment occurs primarily by an ion-exchange mechanism(5). Monitoring studies of river water samples from Germany reported that 50% of an alkyltrimethyl quaternary ammonium compound detectable in the water column was associated with suspended solids in the water; the suspended solids in the water comprise a small fraction of the water(7).

## 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: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

## 14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

### 14.3 Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

### 14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (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
Chlormequat chloride	Chlormequat chloride	999-81-5	213-666-4
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			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

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#### 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 atropine as specific treatment is contraindicated. If the substance is formulated with solvents also consult the ICSCs of these materials. Carrier solvents used in commercial formulations may change physical and toxicological properties.

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

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