**Material Safety Data Sheet（MSDS）**

|  |  |
| --- | --- |
| Product name: Ergothioneine | Prepared according to GB/T 16483 and GB/T 17519 |

## 1. Chemicals and corporate identity

**Chinese name：** 麦角硫因

**English name：** (S)-[1-carboxy-2-(2-mercaptoimidazol-4-yl)ethyl]trimethylammonium hydroxide

**Company：**Chongqing Zhihe Biopharmaceutical Co., Ltd.

**Recommendation and restriction：** Industry and Research

## 2. Hazards Overview

### **Emergencies of overview：**

Skin irritation, severe eye and respiratory irritation

### **GHS Hazard class：**

Skin corrosion/irritation Class 2

severe eye damage / Eye irritation Class 2

Specific target organ toxicity 一One-off contact Class 3

### **Tag element：**

**Pictogram：** 

**Warning word：** Warning

#### **Hazard statement：**

H315 causes skin irritation

H319 causes severe eye irritation

H335 causes respiratory irritation

#### **Precautionary note：**

##### **Preventive measure：**

—— P264 Thorough cleaning after operation

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

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

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

##### **First aid measures：**

—— P302+P352 Skin contact: Wash thoroughly with water.

—— P321 Specific treatment ( Refer to this tab…… )。

—— P332+P313 skin irritation occurs: Seek medical advice/attention.

—— P362+P364 Remove contaminated clothing and wash before reuse.

—— P305+P351+P338 If eye contact： Rinse carefully with water for several minutes. If wearing contact lenses, remove them and continue rinsing.

—— P337+P313 Continued eye irritation: Seek medical attention.

—— P304+P340 If Inhaled: Move the person to fresh air and keep in comfortable breathing position.

—— P312 If feel unwell, call detoxification centre/doctor

##### **Secure storage：**

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

—— P405 The storage area shall be locked.

##### **Waste disposal：**

—— P501 Dispose of contents/containers in accordance with local regulations.

**Physical and chemical hazards：** No data available

**Health hazard:** Causes skin irritation. Causing severe eye irritation. Can cause respiratory irritation.

**Environmental Hazards：** No data available

## 3. Ingredient/composition information

|  |  |  |
| --- | --- | --- |
| **Composition** | **Concentration or concentration range (mass fraction, %)** | **CAS No.** |
| (S)-[1-carboxy-2-(2-mercaptoimidazol-4-yl)ethyl]trimethylammonium hydroxide | 100% | 497-30-3 |

## 4. Emergency and first aid measures

### **Fist aid measures：**

**Inhalation：** If inhaled, move the patient to fresh air.

**Skin contact：** Remove contaminated clothing and rinse skin thoroughly with soap and water. If you feel uncomfortable, seek medical attention.

**Eye contact：** Open the eyelids and rinse with running water or saline. Seek immediate medical attention.

**Ingestion：** Rinse, do not induce vomiting. Seek immediate medical attention.

**Advice for protecting the rescuer：** Move the patient to a safe place. Consult a doctor. Present this chemical safety technical manual to the doctor on site.

**A special note for doctors：** No data available

## 5. Fire-fighting measures

### **Extinguishing media：**

Extinguish fire with water mist, dry powder, foam or carbon dioxide extinguishing agent.

Avoid using direct running water to extinguish the fire, which may cause splashing of flammable liquid and spread the fire.

### **Special hazards：**

No data available

### **Fire-fighting Precautions and Protective Measures:：**

Fire personnel should wear air breathing apparatus, wear full fire clothing, and fight fire upwind.

Remove containers from the fire to an open area if possible.

If the container in the fire scene is discoloured or makes noise from the safety pressure relief device, person present must be evacuated immediately.

Isolate the accident scene and prohibit access by uninvolved persons.

Accommodate and dispose of firefighting water to prevent contamination of the environment.

## 6. Emergency Response to Leakage

### **Operator protective measures, protective equipment and emergency response procedures：**

Emergency responders are advised to wear gas-carrying respirators, anti-static clothing and rubber oil-resistant gloves.

Touching or crossing the spill is prohibited.

All equipment used in the operation should be grounded.

Cut off the source of the spill if possible. Eliminate all sources of ignition.

Designate a warning zone according to the area affected by the flow of liquid, spread of vapour or dust, and evacuate uninvolved personnel to a safe area from the side winds and upwind direction.

**Environmental protection measures：** Accommodate all the spills to avoid contamination to the environment. Prevent spills from entering sewers, surface water and groundwater.

### **Methods of containment and removal of spilled chemicals and disposal of materials used:：**

Small spills: Collect spilled liquid in a sealable container if possible. Absorb with sand, charcoal or other inert material and remove to a safe place. Do not flush down to the drain.

Large spills: construct a dike or dig a pit to contain the spill. Seal drains. Cover with foam to inhibit evaporation. Transfer to tanker or special collector with explosion-proof pump, recycle or transport to waste disposal site for disposal.

## 7. Handling and storage

### **Operating Precautions:**

Operators should be specially trained and strictly observe the operating procedures.

Operation and disposal should be carried out in a place with local ventilation or comprehensive ventilation and air exchange facilities.

Avoid eye and skin contact and inhalation of vapours.

See section 8 for individual protective measures.

Keep away from fire and heat sources. Smoking is strictly prohibited in the workplace.

Use explosion-proof ventilation systems and equipment.

If canning is required, the flow rate should be controlled and grounded facilities needed to prevent static build-up.

Avoid contact with prohibited substances such as oxidant agents (see section 10 for prohibited substances).

Handle with care to prevent damage to packaging and containers.

Empty containers may retain hazardous materials.

Wash hands after use and do not eat or drink in the workplace.

Provide appropriate types and quantities of fire fighting equipment and spillage emergency response equipment.

### **Storage Precautions:**

Store in a cool, ventilated warehouse.

The storage temperature should not exceed 37°C.

Store separately from oxidant agents and edible chemicals and do not mix (see Part 10 for prohibited substances).

Keep containers sealed.

Keep away from fire and heat source.

The ventilation system should be equipped with grounding devices to conduct and remove static electricity.

Use explosion-proof lighting and ventilation settings.

Prohibit the use of equipment and tools that are easy to generate sparks.

The storage area should be equipped with leakage emergency treatment equipment and suitable sheltering materials.

## 8. Exposure control/Personal protection

### **Occupational Exposure Limits：**

| **Composition** | **CAS** | **Standard source** | **Limiting value** | **Note** |
| --- | --- | --- | --- | --- |
| (S)-[1-carboxy-2-(2-mercaptoimidazol-4-yl)ethyl]trimethylammonium hydroxide | 497-30-3 | GBZ 2.1——2007 | MAC：  PC-TWA：  PC-STEL： |  |

### **Biological limit：**

No data available

### **Monitoring methods：**

GBZ/T 160.1 ~ GBZ/T 160.81-2004 Determination of Toxic Substances in Workplace Air (series of standards), EN 14042 Workplace air Guidelines for procedures to assess exposure to chemical or biological agents.

### **Engineering controls：**

The workplace is recommended to be separated from other workplaces.

Enclosed operation to prevent leakage.

Enhance ventilation.

Set up automatic alarm device and emergency ventilation facilities.

Set up emergency evacuation channels and necessary drainage areas.

Set up red area warning line, warning mark and Chinese warning description, and set up communication alarm system.

Safety shower and eye washing facilities available.

### Personal protective equipment**：**

Respiratory protection: Wear a gas filtering mask (half mask) when airborne concentrations are excessive. When rescuing or evacuating in an emergency, a gas-carrying respirator should be worn.

Hand protection: Wear rubber gloves that are resistant to oil.

Eye protection: Wear chemical safety goggles.

Skin and body protection: Wear work uniforms that are impermeable to poisons.

## 9. Physical and Chemical Characteristics

|  |  |
| --- | --- |
| **Appearance：** White solid | **Odor：** No data available |
| **pH value：** No data available | **Melting point/solidification point（°C）：** 275-277°C (dec.) |
| **Boiling point, initial boiling point and boiling range（°C）：** No data available | **Spontaneous combustion temperature（°C）：** No data available |
| **Flash point（°C）：** No data available | **Decomposition temperature（°C）：** No data available |
| **Explosive Limit［％（Volume fraction）］：** No data available | **Rate of evaporation［乙酸（正）丁酯以1计］：** No data available |
| **Saturated vapour pressure（kPa）：** No data available | **Flammability（Solid、Gas）：** No data available |
| **Relative density (Water is measured in 1)：** No data available | **Vapour density（Air is measured in 1）：** No data available |
| **Odour threshold（mg/m³）：** No data available | **N-Octanol-Water Partition Coefficient（lg P）：** No data available |
| **Solubility：** No data available | **Viscosity：** No data available |

## 10. Stability and reactivity

**Stability：** Stable when stored and used at normal ambient temperature.

**Hazardous reaction：** No data available

**Conditions to avoid exposure：** static electronic discharge, heat, humidity, etc.

**Prohibited compounds：** No data available

**Hazardous decomposition products：** No data available。

## 11. Toxicological information

### **Acute toxicity:：**

Oral: No data available

Inhalation: No data available

Transdermal: No data available

### **Skin irritation or corrosion:**

No data available。

### **Eye irritation or corrosion：**

No data available。

### **Breathing or skin allergic：**

No data available。

### **Germ cell mutagenicity：**

No data available。

### **Carcinogenic：**

No data available。

### **Reproductive toxicity：**

No data available。

### **Specific target organ system toxicity - one-off contact：**

No data available

### **Specific target organ system toxicity - repeated contact：**

No data available

### **Inhalation Hazards：**

No data available

## 12. Ecological information

### **Ecotoxicity：**

Fish acute toxicity test: No data available

Acute activity inhibition test for grebes: No data available

Algae growth inhibition test: No data available

Toxicity to microorganisms: No data available

### **Persistence and degradability：**

No data available。

### **Bioconcentration or bioaccumulation：**

No data available。

### **Mobility in soil：**

No data available。

## 13. Waste disposal

### **Waste chemicals：**

Recycle whenever possible.

If recycling is not possible, dispose of by incineration.

Do not dispose of this product by discharging to a sewer.

### **Contaminated packaging:：**

Return containers to manufacturer or dispose of in accordance with state and local regulations.

### **Disposal Precautions：**

Refer to national and local regulations before disposal.

See Section 8 for safety precautions for disposal personnel.

## 14. Transportation information

**UN No. Hazards Goods Code (UN No.)：** No data available

**UN Shipping Name：** No data available

**UN Hazard Classification：** No data available

**Packaging category：** No data available

**Packaging Method：** Packaging according to the manufacturer's recommended method, e.g. open steel drums. Ordinary wooden boxes outside ampoules. Threaded-mouth glass bottles, glass bottles with iron caps and crimped mouths, plastic bottles or metal drums (cans) outside ordinary wooden crates, etc.

**Marine pollutants (Yes/No)：** No

### **Transport precautions：**

Transport vehicles should be equipped with corresponding varieties and quantities of fire-fighting equipment and leakage emergency treatment equipment.

Mixing with oxidant agents and edible chemicals is strictly prohibited.

The exhaust pipe of the vehicle transporting the item must be equipped with a fire stopping device.

The use of tanks (tanks) should be transported when equipped with grounding chain, tanks can be set up inside the hole partition to reduce the shock which generates static electricity.

Prohibit the use of spark-prone mechanical equipment and tools for loading and unloading.

In summer, it is better to transport in the morning and evening.

During transport, it should be protected from sunshine, rain and high temperature.

Stopover should be away from fire, heat source, high temperature area.

Road transport should be in accordance with the prescribed route, do not stop in residential areas and densely populated areas.

Railway transport should be prohibited from slipping.

It is strictly prohibited to transport in bulk by wooden boat or cement boat.

Danger signs and announcements should be posted on the means of transport according to relevant transport requirements.

## 15. Regulatory Information

The following laws, regulations, rules and standards govern the management of this chemical:

### **Composition (S)-[1-carboxy-2-(2-mercaptoimidazol-4-yl)ethyl]trimethylammonium hydroxide CAS: 497-30-3**

#### **Law of the People's Republic of China on the Prevention of Occupational Diseases:：**

Classification Catalogue of Hazardous Factors for Occupational Diseases (2015): not listed

#### **Regulations on Safety Management of Hazardous Chemicals：**

Catalogue of Hazardous Chemicals (2015): not listed

Catalogue of explosive hazardous chemicals (2017): not listed

#### **Catalogue of Hazardous Chemicals under Focused Regulation：**

First and second publication of key regulated hazardous chemicals list: not listed

#### **Registration of Hazardous Chemicals for Environmental Management (Trial)：**

Catalogue of Hazardous Chemicals under Key Environmental Management: Not listed

#### **Regulations on the Administration of Narcotic Drugs and Psychotropic Substances：**

Catalogue of Narcotic Drug Varieties: Not listed

Catalogue of Psychotropic Substances: Not listed

#### **Measures for Environmental Management of New Chemical Substances：**

List of Existing Chemical Substances in China (2013): Not listed

## 16. Other information

### **Preparation and revision information:：**

This is version 1.0, prepared in accordance with GB/T 16483-2008, GB/T 17519-2013, GB 30000 series of classification standards.

### **References：**

【1】International Programme on Chemical Safety: International Chemical Safety Card (ICSC)，URL：http://www.ilo.org/dyn/icsc/showcard.home。

【2】International Agency for Research on Cancer，URL：http://www.iarc.fr/。

【3】OECD Global Platform for Chemical Information，URL：http://www.echemportal.org/echemportal/index?pageID=0&request\_locale=en。

【4】U.S. CAMEO Chemical Substance Database，URL：http://cameochemicals.noaa.gov/search/simple。

【5】U.S. Library of Medicine: Chemical Labelling Database，URL：http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp。

【6】 U.S. Environmental Protection Agency: Integrated Hazard Information System，URL：http://cfpub.epa.gov/iris/。

【7】U.S. Department of Transportation: Emergency Response Guidebook，URL：http://www.phmsa.dot.gov/hazmat/library/erg。

【8】GESTIS - Hazardous Substances Database, Germany，URL：http://gestis-en.itrust.de/。

### **Abbreviations and acronyms:：**

MAC: maximum allowable concentration, the concentration of a toxic chemical that should not be exceeded at a workplace at any time during a workday。

PC-TWA:permissible concentration-time weighted average (permissible concentration-time weighted average), refers to the average permissible concentration of exposure for an 8-h workday, 40-h workweek, using time as the weight.

PC-STEL:permissible concentration-short term exposure limit, the concentration that allows short term exposure (15 min) in compliance with PC-TWA.