

## SAFETY DATA SHEET

## 1. IDENTIFICATION

Product name: Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride complex  
CAS No. : 36309-88-3  
Brand: Macklin  
Company: Shanghai Macklin Biochemical Co.,Ltd.  
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Revision date: 2019/12/12

## 2. HAZARDS IDENTIFICATION

GHS classification

PHYSICAL HAZARDS

no data available

HEALTH HAZARDS

no data available

ENVIRONMENTAL HAZARDS

no data available

GHS label elements, including precautionary statements

Pictograms or hazard symbols

Signal word

no data available

Hazard statements

no data available

Precautionary statements

Prevention

no data available

Response

no data available

Storage

no data available

Disposal

no data available

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components:Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride complex  
CAS No.:36309-88-3  
Chemical Formula:C<sub>72</sub>H<sub>48</sub>Cl<sub>2</sub>N<sub>6</sub>Ru

## 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

no data available

4.3

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

no data available

## 5. FIRE-FIGHTING MEASURES

5.1

Suitable extinguishing media

Use dry chemical, carbon dioxide or alcohol-resistant foam.

5.2

Specific hazards arising from the chemical

no data available

5.3

Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

## 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.

## 7. HANDLING AND STORAGE

### 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.

### Conditions for safe storage, including any incompatibilities

Store the container tightly closed in a dry, cool and well-ventilated place. Store apart from foodstuff containers or incompatible materials.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure limit values

no data available

Biological limit values

no data available

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice.

Set up emergency exits and the risk-elimination area.

#### Personal protective equipment

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

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state

no data available

Colour

no data available

Odour

no data available

Melting point/freezing point

275-279°C (dec.)

Boiling point or initial boiling point and boiling range

543.1°C at 760mmHg

Flammability

no data available

Lower and upper explosion limit/flammability limit

no data available

Flash point

242.1°C

Auto-ignition temperature

no data available

Decomposition temperature

no data available

pH

no data available

Kinematic viscosity

no data available

Solubility

no data available

Partition coefficient n-octanol/water

no data available

Vapour pressure

no data available

Density and/or relative density

no data available

Relative vapour density

no data available

Particle characteristics

no data available

## 10. STABILITY AND REACTIVITY

10.1

Reactivity  
no data available  
10.2  
Chemical stability  
no data available  
10.3  
Possibility of hazardous reactions  
no data available  
10.4  
Conditions to avoid  
no data available  
10.5  
Incompatible materials  
no data available  
10.6  
Hazardous decomposition products  
no data available

## 11. TOXICOLOGICAL INFORMATION

Acute toxicity  
Oral: no data available  
Inhalation: no data available  
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  
no data available  
STOT-repeated exposure  
no data available  
Aspiration hazard  
no data available

## 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  
no data available  
12.3  
Bioaccumulative potential  
no data available  
12.4  
Mobility in soil  
no data available

12.5  
Other adverse effects  
no data available

## 13. DISPOSAL CONSIDERATIONS

### 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.

## 14. TRANSPORT INFORMATION

### 14.1

#### UN Number

ADR/RID: UN3261 (For reference only, please check.)

IMDG: UN3261 (For reference only, please check.)

IATA: UN3261 (For reference only, please check.)

### 14.2

#### UN Proper Shipping Name

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

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

IATA: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (For reference only, please check.)

### 14.3

#### Transport hazard class(es)

ADR/RID: 8 (For reference only, please check.)

IMDG: 8 (For reference only, please check.)

IATA: 8 (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

## 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

Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride complex

Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride complex

36309-88-3

609-229-6

European Inventory of Existing Commercial Chemical Substances (EINECS)  
Not Listed.  
EC Inventory  
Not Listed.  
United States Toxic Substances Control Act (TSCA) Inventory  
Not Listed.  
China Catalog of Hazardous chemicals 2015  
Not Listed.  
New Zealand Inventory of Chemicals (NZIoC)  
Not 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.

## 16. OTHER INFORMATION

This SDS was prepared sincerely on the basis of the information we could obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling, sufficient care should be taken, in addition to the safety measures suitable for the situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.