

## SAFETY DATA SHEET

Revision Date 21-Feb-2020

Revision Number 2

### 1. Identification

**Product Name** Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride

**Cat No. :** 44123

**CAS-No** 36309-88-3

**Synonyms** No information available

**Recommended Use** Laboratory chemicals.

**Uses advised against** Food, drug, pesticide or biocidal product use.

**Details of the supplier of the safety data sheet**

**Company**

Alfa Aesar  
Thermo Fisher Scientific Chemicals, Inc.  
30 Bond Street  
Ward Hill, MA 01835-8099  
Tel: 800-343-0660  
Fax: 800-322-4757  
**Email:** tech@alfa.com  
www.alfa.com

**Emergency Telephone Number**

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660.  
After normal business hours, call Carechem 24 at (866) 928-0789.

### 2. Hazard(s) identification

**Classification**

Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Based on available data, the classification criteria are not met

**Label Elements**

None required

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition/Information on Ingredients

| Component                                           | CAS-No     | Weight % |
|-----------------------------------------------------|------------|----------|
| Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) | 36309-88-3 | <=100    |

|            |  |  |
|------------|--|--|
| dichloride |  |  |
|------------|--|--|

#### 4. First-aid measures

|                                            |                                                                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Eye Contact</b>                         | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.         |
| <b>Skin Contact</b>                        | Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur. |
| <b>Inhalation</b>                          | Remove to fresh air. Get medical attention immediately if symptoms occur.                                               |
| <b>Ingestion</b>                           | Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.                   |
| <b>Most important symptoms and effects</b> | None reasonably foreseeable.                                                                                            |
| <b>Notes to Physician</b>                  | Treat symptomatically                                                                                                   |

#### 5. Fire-fighting measures

|                                         |                          |
|-----------------------------------------|--------------------------|
| <b>Unsuitable Extinguishing Media</b>   | No information available |
| <b>Flash Point</b>                      | No information available |
| <b>Method -</b>                         | No information available |
| <b>Autoignition Temperature</b>         | No information available |
| <b>Explosion Limits</b>                 |                          |
| <b>Upper</b>                            | No data available        |
| <b>Lower</b>                            | No data available        |
| <b>Sensitivity to Mechanical Impact</b> | No information available |
| <b>Sensitivity to Static Discharge</b>  | No information available |

#### Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition.

#### Hazardous Combustion Products

Ruthenium oxide.

#### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

#### NFPA

|               |                     |                    |                         |
|---------------|---------------------|--------------------|-------------------------|
| <b>Health</b> | <b>Flammability</b> | <b>Instability</b> | <b>Physical hazards</b> |
| 0             | 1                   | 0                  | -                       |

#### 6. Accidental release measures

|                                  |                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------|
| <b>Personal Precautions</b>      | Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.  |
| <b>Environmental Precautions</b> | Should not be released into the environment. See Section 12 for additional Ecological Information. |

**Methods for Containment and Clean Up** Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

#### 7. Handling and storage

|                 |                                                                                                                                                                                   |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Handling</b> | Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid contact with skin, eyes or clothing. Avoid ingestion and inhalation. Avoid dust formation. |
| <b>Storage</b>  | Keep containers tightly closed in a dry, cool and well-ventilated place.                                                                                                          |

## 8. Exposure controls / personal protection

|                            |                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exposure Guidelines</b> | This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies. |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

|                             |                                   |
|-----------------------------|-----------------------------------|
| <b>Engineering Measures</b> | None under normal use conditions. |
|-----------------------------|-----------------------------------|

### Personal Protective Equipment

|                                 |                                                                                                                                                                             |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye/face Protection</b>      | Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. |
| <b>Skin and body protection</b> | Wear appropriate protective gloves and clothing to prevent skin exposure.                                                                                                   |
| <b>Respiratory Protection</b>   | No protective equipment is needed under normal use conditions.                                                                                                              |
| <b>Hygiene Measures</b>         | Handle in accordance with good industrial hygiene and safety practice.                                                                                                      |

## 9. Physical and chemical properties

|                                               |                          |
|-----------------------------------------------|--------------------------|
| <b>Physical State</b>                         | Solid                    |
| <b>Appearance</b>                             | No information available |
| <b>Odor</b>                                   | No information available |
| <b>Odor Threshold</b>                         | No information available |
| <b>pH</b>                                     | No information available |
| <b>Melting Point/Range</b>                    | No data available        |
| <b>Boiling Point/Range</b>                    | No information available |
| <b>Flash Point</b>                            | No information available |
| <b>Evaporation Rate</b>                       | Not applicable           |
| <b>Flammability (solid,gas)</b>               | No information available |
| <b>Flammability or explosive limits</b>       |                          |
| Upper                                         | No data available        |
| Lower                                         | No data available        |
| <b>Vapor Pressure</b>                         | No information available |
| <b>Vapor Density</b>                          | Not applicable           |
| <b>Specific Gravity</b>                       | No information available |
| <b>Solubility</b>                             | No information available |
| <b>Partition coefficient; n-octanol/water</b> | No data available        |
| <b>Autoignition Temperature</b>               | No information available |
| <b>Decomposition Temperature</b>              | No information available |
| <b>Viscosity</b>                              | Not applicable           |
| <b>Molecular Formula</b>                      | C72 H48 Cl2 N6 Ru        |
| <b>Molecular Weight</b>                       | 1169.20                  |

## 10. Stability and reactivity

|                            |                                            |
|----------------------------|--------------------------------------------|
| <b>Reactive Hazard</b>     | None known, based on information available |
| <b>Stability</b>           | Stable under normal conditions.            |
| <b>Conditions to Avoid</b> | Incompatible products.                     |

|                                         |                                          |
|-----------------------------------------|------------------------------------------|
| <b>Incompatible Materials</b>           | Strong oxidizing agents                  |
| <b>Hazardous Decomposition Products</b> | Ruthenium oxide                          |
| <b>Hazardous Polymerization</b>         | Hazardous polymerization does not occur. |
| <b>Hazardous Reactions</b>              | None under normal processing.            |

## 11. Toxicological information

### Acute Toxicity

#### Product Information

#### Component Information

|                                             |                          |
|---------------------------------------------|--------------------------|
| <b>Toxicologically Synergistic Products</b> | No information available |
|---------------------------------------------|--------------------------|

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

|                        |                                                                                          |
|------------------------|------------------------------------------------------------------------------------------|
| <b>Irritation</b>      | No information available                                                                 |
| <b>Sensitization</b>   | No information available                                                                 |
| <b>Carcinogenicity</b> | The table below indicates whether each agency has listed any ingredient as a carcinogen. |

| Component                                                      | CAS-No     | IARC       | NTP        | ACGIH      | OSHA       | Mexico     |
|----------------------------------------------------------------|------------|------------|------------|------------|------------|------------|
| Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride | 36309-88-3 | Not listed | Not listed | Not listed | Not listed | Not listed |

|                                                   |                                                                |
|---------------------------------------------------|----------------------------------------------------------------|
| <b>Mutagenic Effects</b>                          | No information available                                       |
| <b>Reproductive Effects</b>                       | No information available.                                      |
| <b>Developmental Effects</b>                      | No information available.                                      |
| <b>Teratogenicity</b>                             | No information available.                                      |
| <b>STOT - single exposure</b>                     | None known                                                     |
| <b>STOT - repeated exposure</b>                   | None known                                                     |
| <b>Aspiration hazard</b>                          | No information available                                       |
| <b>Symptoms / effects, both acute and delayed</b> | No information available                                       |
| <b>Endocrine Disruptor Information</b>            | No information available                                       |
| <b>Other Adverse Effects</b>                      | The toxicological properties have not been fully investigated. |

## 12. Ecological information

### Ecotoxicity

Do not empty into drains.

|                                      |                                                                       |
|--------------------------------------|-----------------------------------------------------------------------|
| <b>Persistence and Degradability</b> | Insoluble in water                                                    |
| <b>Bioaccumulation/ Accumulation</b> | No information available.                                             |
| <b>Mobility</b>                      | Is not likely mobile in the environment due its low water solubility. |

### 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

### 14. Transport information

**DOT** Not regulated  
**TDG** Not regulated  
**IATA** Not regulated  
**IMDG/IMO** Not regulated

### 15. Regulatory information

#### United States of America Inventory

| Component                                                      | CAS-No     | TSCA | TSCA Inventory notification - Active/Inactive | TSCA - EPA Regulatory Flags |
|----------------------------------------------------------------|------------|------|-----------------------------------------------|-----------------------------|
| Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride | 36309-88-3 | -    | -                                             | -                           |

#### Legend:

**TSCA** - Toxic Substances Control Act, (40 CFR Part 710)

X - Listed

'-' - Not Listed

**TSCA 12(b)** - Notices of Export Not applicable

#### International Inventories

Canada (DSL/NDL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

| Component                                                      | CAS-No     | DSL | NDL | EINECS | PICCS | ENCS | AICS | IECSC | KECL |
|----------------------------------------------------------------|------------|-----|-----|--------|-------|------|------|-------|------|
| Tris(4,7-diphenyl-1,10-phenanthroline)ruthenium(II) dichloride | 36309-88-3 | -   | -   | -      | -     | -    | -    | -     | -    |

#### U.S. Federal Regulations

**SARA 313** Not applicable

**SARA 311/312 Hazard Categories** See section 2 for more information

**CWA (Clean Water Act)** Not applicable

**Clean Air Act** Not applicable

**OSHA** - Occupational Safety and Health Administration Not applicable

**CERCLA** Not applicable

**California Proposition 65** This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations** Not applicable

#### U.S. Department of Transportation

Reportable Quantity (RQ): N  
 DOT Marine Pollutant N  
 DOT Severe Marine Pollutant N

**U.S. Department of Homeland  
Security**

This product does not contain any DHS chemicals.

**Other International Regulations**

**Mexico - Grade**

No information available

**16. Other information**

**Prepared By**

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**Revision Summary**

SDS authoring systems update, replaces ChemGes SDS No. 36309-88-3.

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**