福建沃尔法化学科技有限公司
Fujian Wolfa Chemical Technology Co., Ltd

DESIGN REPORT OF SAFETY DATA SHEET

Revision Date: Aug. 29, 2024

Name of the sample	Ruthenium(III) chloride hydrate
Applicant	Fujian Wolfa Chemical Technology Co., Ltd.
Supplier	Fujian Wolfa Chemical Technology Co., Ltd.
Composition of the sample	Ruthenium(III) chloride hydrate: ≥99%
Warranty of Design	GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) Eleventh revised edition
Design Result of SDS please see next page.	

Notes:This SDS is valid before the implementation of the Twelfth revised edition GHS.

Section 1 Product and Company Identification

> Product Identifier

Product Name	Ruthenium(III) chloride hydrate
Synonyms	——
CAS No.	14898-67-0
EC No.	604-667-4
Molecular Formula	$RuCl_3 \cdot xH_2O$

> Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Relevant Identified Uses	Please consult manufacturer.
Uses Advised Against	Please consult manufacturer.

> Details of the Supplier of the Safety Data Sheet

Applicant Name	Fujian Wolfa Chemical Technology Co., Ltd.
Application Address	Room 2620, Building 18, Xingguang Plaza, No.970 Anji South Road, Fengze District, Quanzhou City, Fujian Province
Applicant Post Code	362000
Applicant Telephone	+86-17854166533
Applicant Fax	——
Applicant E-mail	——
Supplier Name	Fujian Wolfa Chemical Technology Co., Ltd.
Supplier Address	Room 2620, Building 18, Xingguang Plaza, No.970 Anji South Road, Fengze District, Quanzhou City, Fujian Province
Supplier Post Code	362000
Supplier Telephone	+86-17854166533
Supplier Fax	——
Supplier E-mail	——

> Emergency Phone Number

Emergency Phone Number	+86-17854166533

Section 2 Hazards Identification

Hazard class and label elements of the product according to GHS (the Eleventh revised edition):

> GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Substances/mixtures corrosive to metals	Category 1

Acute toxicity – oral	Category 4
Skin corrosion/irritation	Category 1B
Severe eye damage / Eye irritation	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 1

> GHS Label Elements

Pictogram



Signal Word Danger

> Hazard Statements

H290	May corrode metals.
H302	Swallowing harmful substances.
H314	Causing severe skin burns and eye injuries.
H410	Extremely toxic to aquatic organisms and with long-lasting effects.

> Precautionary Statements

Prevention

P234	Obtain special instructions before use.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P284	wear respiratory protection.

Response

P303+P361+P353	If the skin (or hair) gets contaminated: Immediately remove all the contaminated clothing. Wash the skin with water / take a shower.
P304+P340+P310	IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338 + P310	If it gets into your eyes: Rinse your eyes carefully with water for several minutes. If you are wearing contact lenses and can easily remove them, remove the contact lenses. Continue rinsing. Immediately call the emergency center/doctor.
P330	Rinse mouth.
P331	Do NOT induce vomiting.
P390	Absorb the spilled substances to prevent damage to the materials.
P362+P364	Remove the soiled clothes and clean them before they can be used again.

Storage

P402	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P406	Stored in a corrosion-resistant polypropylene container with a corrosion-resistant inner lining.

Disposal

P501	Dispose of contents/container to an appropriate treatment and disposal facility in accordancewith applicable laws and regulations, and product characteristics at time of disposal.

Section 3 Composition/Information on Ingredients

Component	CAS No.	EC No.	Concentration (weight percent, %)
Ruthenium(III) chloride hydrate	14898-67-0	604-667-4	≥99

Section 4 First Aid Measures

> Description of First Aid Measures

General Advice	Show this safety data sheet to the doctor in attendance.Seek immediate medical advice.
Following eye contact	Rinse opened eye for several minutes under running water.Then consult doctor.
Following skin contact	Immediately wash with water and soap and rinse thoroughly.Seek immediate medical advice.
If swallowed	After ingestion: Have the injured person drink water (up to 2 cups), avoid inducing vomiting (there is a risk of perforation!). Immediately call a doctor. Do not attempt to neutralize.
If inhalation	Supply fresh air. If required, provide artificial respiration. Keep patient warm.Seek immediate medical advice.
Protection of emergency responders	Ensure that medical staff are aware of the hazardous properties of the product and take protective measures for themselves to safeguard their own safety and prevent the spread of contamination.

> Most Important Symptoms and Effects, both Acute and Delayed

The most important known symptoms and effects have been described in the label (refer to Chapter 2) and/or Chapter 11.

> Indication of Any Immediate Medical Attention and Special Treatment Needed

No data available.

Section 5 Fire Fighting Measures

> Extinguishing Media

Suitable extinguishing media: Water mist, dry powder, foam or carbon dioxide fire extinguishing agents for fire suppression.

For safety reasons unsuitable extinguishing agents: Avoid using direct water to extinguish fires. Direct water may cause the splashing of flammable liquids, thereby spreading the fire.

> Specific Hazards Arising from the chemical

Hydrogen chloride gas.

Ruthenium oxide.

Non-flammable.

In case of fire, it may result in:

Hydrogen chloride gas

The surrounding fire source may cause the release of hazardous vapors.

> Special protective actions for fire-fighters

People without personal breathing apparatus must not enter the dangerous area.

Maintain a safe distance and wear appropriate protective clothing to avoid skin contact.

Spray water to suppress gases/vapors/droplets.

Prevent the fire-fighting water from polluting the surface and groundwater systems.

Section 6 Accidental Release Measure

> Personal Precautions, Protective Equipment and Emergency Procedures

1. Advice for non-emergency personnel: Avoid inhaling dust.
2. Avoid physical contact. Ensure adequate ventilation.
3. Evacuate dangerous areas, follow emergency procedures, and seek expert advice.
4. For personal protection, please refer to Part 8.

> Environmental Precautions

Do not let the product go down the drain.

> Methods and Materials for Containment and Cleaning Up

1. Cover the sewer.
2. Collect, contain and remove the leaked substance.
3. Comply with any applicable material restrictions (see sections 7 and 10).
4. Dry and remove. Clean the affected area.
5. Avoid dust generation.

Section 7 Handling and Storage

> Precautions for Handling

For preventive measures, please refer to Chapter 2.

> Conditions for safe storage, including any incompatibilities

1. Storage conditions: Closed. Dry. It is recommended to refer to the product label for the storage temperature.

2 VCI storage grade: German storage grade (TRGS 510): 8A: Flammable, corrosive hazardous substances.

Section 8 Exposure Controls/Personal Protection

> Control Parameters

Occupational Exposure Limit Values

Substances without occupational exposure limits.

Biological Limit Values

No information available.

> Exposure Controls

Appropriate technical control: Immediately replace contaminated clothing. Use skin protection lotion. Wash hands and face after using this substance.

> Personal Protection Equipment

Eye/face protection	Please use eye protection equipment that has been tested and approved by official standards such as NIOSH (in the United States) or EN 166 (in the European Union). Sealed protective glasses
Skin protection	This suggestion is only applicable to products provided by us and listed on the safety data sheet, and used for the purposes specified by us. When dissolved in or mixed with other substances, or when encountering situations deviating from the provisions of EN374, please contact the supplier of CE-approved gloves.
Full contact	Material: Nitrile rubber Minimum layer thickness: 0.11 mm Solvent penetration time: 480 minutes Tested substances: KCL 741, Dermatril® L
Splash protection	Material: Nitrile rubber Minimum layer thickness: 0.11 mm Solvent penetration time: 480 minutes Tested substances: KCL 741, Dermatril® L
Physical protection	Wear protective clothing It is necessary during the generation of dust.
Respiratory protection	Our recommendations for filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387, and other associated standards related to the used respiratory protection devices.
Environmental exposure control	Don't let the product go down the drain.

Section 9 Physical and Chemical Properties

Appearance: Brown powder

Odor: No data

Odor Threshold: No data

pH: No data

Melting Point/Freezing Point (℃): 100 ℃ (212 °F) (dec)

Initial Boiling Point and Boiling Range (℃): No data

Flash Point (℃): No data

Evaporation Rate: No data

Flammability: No data

Upper/lower explosive limits[%(v/v)]: Upper limit: No information available; Lower limit: No data

Vapor Pressure (KPa): No data

Relative Vapour Density(Air=1): No data

Relative Density(Water=1): No data

Solubility: Soluble in water

n-Octanol/Water Partition Coefficient: No data

Auto-Ignition Temperature(℃): No data

Decomposition Temperature (℃): No data

Kinematic Viscosity (mm^2/s): No data

Particle Characteristics: No data

Critical Temperature(℃): No data

Section 10 Stability and Reactivity

Reactivity	Contact with incompatible substances may lead to decomposition or other chemical reactions.
Chemical Stability	Stable under the correct usage and storage conditions.
Possibility of Hazardous Reactions	No data.
Conditions to Avoid	Incompatible substances: heat, flames and sparks.
Incompatible Materials	Aluminum, low-carbon steel, zinc.
Hazardous Decomposition Products	Under normal storage and usage conditions, no dangerous decomposition products will be generated.

Section 11 Toxicological Information

> Acute Toxicity

Acute toxicity estimate: Oral - 500.1 mg/kg

(Expert opinion)

Oral: No data available.

Symptoms: Mucosal irritation, coughing, shortness of breath, possible damage:, damage to respiratory tract.

Percutaneous: No data available.

> Skin Corrosion/Irritation

Causes skin burns.

> Serious Eye Damage/Irritation

Causes severe eye damage.

> Respiratory or skin Sensitization

No information available

> Germ Cell Mutagenicity

No information available

> Carcinogenicity

ID	CAS No.	Formula	IARC	NTP

1	14898-67-0	Ruthenium(Ⅲ) chloride hydrate	Unlisted	Unlisted

> Reproductive Toxicity

No information available

> Specific target organ system toxicity (single exposure)

No information available

> Specific target organ system toxicity (repeated exposure)

No information available

> Additional Notes

This substance causes severe damage to mucous membranes, the upper respiratory tract, the eyes and the skin. Coughing, shortness of breath, headache, nausea.

As far as we know, the chemical, physical and toxic properties of this substance have not been fully studied.

Systemic effects:

1 After excessive consumption:

2 Muscle spasms

3 Blood pressure drop

4 Fatigue

Other dangers cannot be ruled out.

Operate in accordance with good industrial hygiene and safety standards.

Section 12 Ecological Information

> Ecotoxicity

No information available

> Others

Persistence and degradability	The biodegradation testing method is not applicable to inorganic substances.
Bioaccumulative potential	No information available.
Mobility in soil	No information available.
Other adverse effects	No information available.

Section 13 Disposal Considerations

> Waste treatment methods

Hand over the remaining and non-recyclable solutions to a company with a license for processing.

Section 14 Transport Information

Transporting Label



Hazard class	8
UN Number	3260
Proper Shipping Name	Corrosive solid, acidic, inorganic, N.O.S. (ruthenium(Ⅲ) chloride hydrate)
Transport Hazard Class	8
Packing Group	Ⅲ

Section15 Regulatory Information

> Regulatory Information

Name	EINECS	TSCA	DSL	IECSC	NZIoC	PICCS	KECL	AICS	ENCS
Ruthenium(Ⅲ) chloride hydrate	×	×	×	×	√	×	×	×	×

【EINECS】 European Inventory of Existing Commercial Chemical Substances
【TSCA】 Toxic Substances Control Act Inventory (United States)
【DSL】 Domestic Substances List (Canada)
【IECSC】 Inventory of Existing Chemical Substances in China
【NZIoC】 New Zealand Inventory of Chemicals
【PICCS】 Philippines Inventory of Chemicals and Chemical Substances
【KECL】 Korean Existing Chemicals List
【AIIC】 Australian Inventory of Industrial Chemicals
【ENCS】 Existing and New Chemical Substances (Japan)

Note
"√" Indicates that the substance included in the regulations
"×" That no data or included in the regulations

Section 16 Additional Information

Preparation Date	Dec.1,2022
Revision Date	Aug .29,2024
Revision Reason	SDS Update Section

Disclaimer

The information provided in this Safety Data Sheet is correct based on the latest knowledge, information and concepts available to us. The information provided is intended only as a guide for safe operation, use, processing, storage, transportation, disposal and discharge and is not intended as a guarantee or specification of quality. This information is only used for the specific substance specified and may not be suitable for mixing with any other substance or in all cases, unless otherwise specified in the context.