

# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



Safety Data Sheet dated 5/10/2023, version 6

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Identification of the substance

Trade name: F104 - RUTHENIUM CHLORIDE HYDRATE

Trade code: F104

Name: Ruthenium chloride hydrate

CAS number: 14898-67-0

EC number: 604-667-4

REACH: The substance is not subject to registration as it is produced in amounts less than 1 ton/year

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended use:

Galvanic, base and lab chemistry

#### 1.3. Details of the supplier of the safety data sheet

Company:

CABRO SPA - AREZZO

Road Setteponti 141

52100 - Italy

CABRO SPA

Phone n. +39 0575 984442

Office hours: 9-13 / 14.30-17.30

Competent person responsible for the safety data sheet:

sds@cabro.it

#### 1.4. Emergency telephone number

CABRO SPA

Phone n. +39 0575 984442

Office hours: 9-13 / 14.30-17.30

Single European emergency number: 112

Poison Information Center - 24/24h Foggia Hospital - Phone +39 0881-732326

Poison Information Center - 24/24h Bergamo Hospital - Phone +39 800 883300

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

EC regulation criteria 1272/2008 (CLP)

⚠ Warning, Met. Corr. 1, May be corrosive to metals.

⚠ Warning, Acute Tox. 4, Harmful if swallowed.

⚠ Danger, Skin Corr. 1B, Causes severe skin burns and eye damage.

⚠ Danger, Eye Dam. 1, Causes serious eye damage.

⚠ Warning, Aquatic Acute 1, Very toxic to aquatic life.

⚠ Warning, Aquatic Chronic 1, Very toxic to aquatic life with long lasting effects.

EUH071 Corrosive to the respiratory tract.

Adverse physicochemical, human health and environmental effects:

No other hazards

#### 2.2. Label elements

Hazard pictograms:



# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



Danger

Hazard statements:

H290 May be corrosive to metals.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P264 Wash hands thoroughly after handling.

P273 Avoid release to the environment.

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

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER/doctor.

P391 Collect spillage.

Special Provisions:

EUH071 Corrosive to the respiratory tract.

Contains

Ruthenium chloride hydrate

Special provisions according to Annex XVII of REACH and subsequent amendments:

None

### 2.3. Other hazards

No PBT, vPvB or endocrine disruptor substances present in concentration  $\geq 0.1\%$

Other Hazards:

No other hazards

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Identification of the substance

Chemical characterization: Ruthenium chloride hydrate

Trade code: F104

CAS number: 14898-67-0

EC number: 604-667-4

Qty	Name	Ident. Number	Classification
100 %	Ruthenium chloride hydrate	CAS: 14898-67-0 EC: 604-667-4	2.16/1 Met. Corr. 1 H290 3.2/1B Skin Corr. 1B H314 3.1/4/Oral Acute Tox. 4 H302 3.3/1 Eye Dam. 1 H318 4.1/A1 Aquatic Acute 1 H400 M=1. 4.1/C1 Aquatic Chronic 1 H410 M=1. EUH071

### 3.2. Mixtures

N.A.

## **SECTION 4: First aid measures**

### **4.1. Description of first aid measures**

In case of skin contact:

Immediately take off all contaminated clothing.  
OBTAIN IMMEDIATE MEDICAL ATTENTION.  
Remove contaminated clothing immediately and dispose off safely.  
After contact with skin, wash immediately with soap and plenty of water.

In case of eyes contact:

After contact with the eyes, rinse with water with the eyelids open for a sufficient length of time, then consult an ophthalmologist immediately.  
Protect uninjured eye.

In case of Ingestion:

Give nothing to eat or drink.  
Do not under any circumstances induce vomiting. OBTAIN A MEDICAL EXAMINATION IMMEDIATELY.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

### **4.2. Most important symptoms and effects, both acute and delayed**

None

### **4.3. Indication of any immediate medical attention and special treatment needed**

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Treatment:

None

---

## **SECTION 5: Firefighting measures**

### **5.1. Extinguishing media**

Suitable extinguishing media:

Water.

Carbon dioxide (CO<sub>2</sub>).

Extinguishing media which must not be used for safety reasons:

None in particular.

### **5.2. Special hazards arising from the substance or mixture**

Do not inhale combustion gases

Burning produces heavy smoke.

### **5.3. Advice for firefighters**

Use suitable breathing apparatus .

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

---

## **SECTION 6: Accidental release measures**

### **6.1. Personal precautions, protective equipment and emergency procedures**

For non emergency personnel:

Wear personal protection equipment.

Remove persons to safety.

See protective measures under point 7 and 8.

For emergency responders:

Wear personal protection equipment.

### **6.2. Environmental precautions**

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



- Suitable material for taking up: absorbing material, organic, sand
- 6.3. Methods and material for containment and cleaning up**  
Wash with plenty of water.
- 6.4. Reference to other sections**  
See also section 8 and 13

---

### SECTION 7: Handling and storage

- 7.1. Precautions for safe handling**  
Avoid contact with skin and eyes, inhalation of vapours and mists.  
Don't use empty container before they have been cleaned.  
Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.  
See also section 8 for recommended protective equipment.  
Advice on general occupational hygiene:  
Contaminated clothing should be changed before entering eating areas.  
Do not eat or drink while working.
- 7.2. Conditions for safe storage, including any incompatibilities**  
Keep away from food, drink and feed.  
Incompatible materials:  
None in particular.  
Instructions as regards storage premises:  
Adequately ventilated premises.
- 7.3. Specific end use(s)**  
None in particular

---

### SECTION 8: Exposure controls/personal protection

- 8.1. Control parameters**  
No occupational exposure limit available  
DNEL Exposure Limit Values  
Ruthenium chloride hydrate - CAS: 14898-67-0  
Worker Industry: 380 µg/m<sup>3</sup> - Worker Professional: 380 µg/m<sup>3</sup> - Exposure: Human  
Inhalation - Frequency: Long Term, systemic effects  
Worker Industry: 0.27 mg/kg bw/day - Worker Professional: 0.27 mg/kg bw/day -  
Exposure: Human Dermal - Frequency: Long Term, systemic effects  
PNEC Exposure Limit Values  
Ruthenium chloride hydrate - CAS: 14898-67-0  
Target: Fresh Water - Value: 244 ng/L  
Target: Periodic release, aquatic - Value: 2.44 µg/l  
Target: Marine water - Value: 24.4 ng/L  
Target: Sewage treatment plant - Value: 8.92 mg/l  
Target: Freshwater sediments - Value: 7.62 mg/kg dwt  
Target: Marine water sediments - Value: 0.762 mg/kg dwt
- 8.2. Exposure controls**  
Eye protection:  
Use close fitting safety goggles, don't use eye lens.  
Protection for skin:  
Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton.  
Protection for hands:  
Use protective gloves that provides comprehensive protection, e.g. P.V.C., neoprene or rubber.  
Respiratory protection:  
Not needed for normal use.  
Thermal Hazards:  
None  
Environmental exposure controls:

# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



None  
Appropriate engineering controls:  
None

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Properties	Value	Method:	Notes
Physical state:	Solid	--	--
Colour:	Black	--	--
Odour:	odorless	--	--
Melting point/freezing point:	N.A.	--	--
Boiling point or initial boiling point and boiling range:	N.A.	--	--
Flammability:	Non-flammable	--	--
Lower and upper explosion limit:	N.A.	--	--
Flash point:	N.A.	--	--
Auto-ignition temperature:	N.A.	--	--
Decomposition temperature:	N.A.	--	--
pH:	N.A.	--	--
Kinematic viscosity:	N.A.	--	--
Solubility in water:	Soluble	--	--
Solubility in oil:	N.A.	--	--
Partition coefficient n-octanol/water (log value):	N.A.	--	--
Vapour pressure:	N.A.	--	--
Density and/or relative density:	N.A.	--	--
Relative vapour density:	N.A.	--	--
Particle characteristics:			
Particle size:	N.A.	--	--

# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



### 9.2. Other information

Properties	Value	Method:	Notes
Miscibility:	N.A.	--	--

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Stable under normal conditions

### 10.2. Chemical stability

Stable under normal conditions

### 10.3. Possibility of hazardous reactions

None

### 10.4. Conditions to avoid

Stable under normal conditions.

### 10.5. Incompatible materials

None in particular.

### 10.6. Hazardous decomposition products

None.

## SECTION 11: Toxicological information

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Toxicological information of the substance:

Ruthenium chloride hydrate - CAS: 14898-67-0

#### a) acute toxicity

The product is classified: Acute Tox. 4 H302

#### b) skin corrosion/irritation

The product is classified: Skin Corr. 1B H314

#### c) serious eye damage/irritation

The product is classified: Eye Dam. 1 H318

#### d) respiratory or skin sensitisation

Not classified

Based on available data, the classification criteria are not met

#### e) germ cell mutagenicity

Not classified

Based on available data, the classification criteria are not met

#### f) carcinogenicity

Not classified

Based on available data, the classification criteria are not met

#### g) reproductive toxicity

Not classified

Based on available data, the classification criteria are not met

#### h) STOT-single exposure

Not classified

Based on available data, the classification criteria are not met

#### i) STOT-repeated exposure

Not classified

Based on available data, the classification criteria are not met

#### j) aspiration hazard

Not classified

Based on available data, the classification criteria are not met

### 11.2. Information on other hazards

# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



Endocrine disrupting properties:

No endocrine disruptor substances present in concentration  $\geq 0.1\%$

---

### SECTION 12: Ecological information

#### 12.1. Toxicity

Adopt good working practices, so that the product is not released into the environment.

Ruthenium chloride hydrate - CAS: 14898-67-0

The product is classified: Aquatic Acute 1 - H400; Aquatic Chronic 1 - H410

#### 12.2. Persistence and degradability

N.A.

#### 12.3. Bioaccumulative potential

N.A.

#### 12.4. Mobility in soil

N.A.

#### 12.5. Results of PBT and vPvB assessment

vPvB Substances: None - PBT Substances: None

#### 12.6. Endocrine disrupting properties

No endocrine disruptor substances present in concentration  $\geq 0.1\%$

#### 12.7. Other adverse effects

None

---

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force.

---

### SECTION 14: Transport information



#### 14.1. UN number or ID number

ADR-UN Number: 3260

IATA-UN Number: 3260

IMDG-UN Number: 3260

#### 14.2. UN proper shipping name

ADR-Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.  
(Ruthenium chloride hydrate)

IATA-Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.  
(Ruthenium chloride hydrate)

IMDG-Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.  
(Ruthenium chloride hydrate)

#### 14.3. Transport hazard class(es)

ADR-Class: 8

ADR - Hazard identification number: 80

IATA-Class: 8

IATA-Label: 8

IMDG-Class: 8

#### 14.4. Packing group

ADR-Packing Group: II

IATA-Packing group: II

IMDG-Packing group: II

#### 14.5. Environmental hazards

## Safety Data Sheet

### F104 - RUTHENIUM CHLORIDE HYDRATE



ADR-Environmental Pollutant: Yes  
IMDG-Marine pollutant: Marine Pollutant  
IMDG-EmS: F-A,  
S-B

#### 14.6. Special precautions for user

ADR-Subsidiary hazards: -  
ADR-S.P.: 274  
ADR-Transport category (Tunnel restriction code): 2 (E)  
IATA-Passenger Aircraft: 859  
IATA-Subsidiary hazards: -  
IATA-Cargo Aircraft: 863  
IATA-S.P.: A3 A803  
IATA-ERG: 8L  
IMDG-Subsidiary hazards: -  
IMDG-Stowage and handling: Category B  
IMDG-Segregation: SGG1 SG36 SG49

#### 14.7. Maritime transport in bulk according to IMO instruments

N.A.

---

## SECTION 15: Regulatory information

#### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Dir. 98/24/EC (Risks related to chemical agents at work)  
Dir. 2000/39/EC (Occupational exposure limit values)  
Regulation (EC) n. 1907/2006 (REACH)  
Regulation (EC) n. 1272/2008 (CLP)  
Regulation (EC) n. 790/2009 (ATP 1 CLP) and (EU) n. 758/2013  
Regulation (EU) n. 2020/878  
Regulation (EU) n. 286/2011 (ATP 2 CLP)  
Regulation (EU) n. 618/2012 (ATP 3 CLP)  
Regulation (EU) n. 487/2013 (ATP 4 CLP)  
Regulation (EU) n. 944/2013 (ATP 5 CLP)  
Regulation (EU) n. 605/2014 (ATP 6 CLP)  
Regulation (EU) n. 2015/1221 (ATP 7 CLP)  
Regulation (EU) n. 2016/918 (ATP 8 CLP)  
Regulation (EU) n. 2016/1179 (ATP 9 CLP)  
Regulation (EU) n. 2017/776 (ATP 10 CLP)  
Regulation (EU) n. 2018/669 (ATP 11 CLP)  
Regulation (EU) n. 2018/1480 (ATP 13 CLP)  
Regulation (EU) n. 2019/521 (ATP 12 CLP)  
Regulation (EU) n. 2020/217 (ATP 14 CLP)  
Regulation (EU) n. 2020/1182 (ATP 15 CLP)  
Regulation (EU) n. 2021/643 (ATP 16 CLP)  
Regulation (EU) n. 2021/849 (ATP 17 CLP)

Restrictions related to the product or the substances contained according to Annex XVII Regulation (EC) 1907/2006 (REACH) and subsequent modifications:

Restrictions related to the product:

No restriction.

Restrictions related to the substances contained:

No restriction.

Where applicable, refer to the following regulatory provisions :

Directive 2012/18/EU (Seveso III)  
Regulation (EC) nr 648/2004 (detergents).  
Dir. 2004/42/EC (VOC directive)



# Safety Data Sheet

## F104 - RUTHENIUM CHLORIDE HYDRATE



Provisions related to directive EU 2012/18 (Seveso III):  
Seveso III category according to Annex 1, part 1  
Product belongs to category: E1

### 15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for the substance.

---

## SECTION 16: Other information

Full text of phrases referred to in Section 3:

H290 May be corrosive to metals.

H314 Causes severe skin burns and eye damage.

H302 Harmful if swallowed.

H318 Causes serious eye damage.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

EUH071 Corrosive to the respiratory tract.

Hazard class and hazard category	Code	Description
Met. Corr. 1	2.16/1	Substance or mixture corrosive to metals, Category 1
Acute Tox. 4	3.1/4/Oral	Acute toxicity (oral), Category 4
Skin Corr. 1B	3.2/1B	Skin corrosion, Category 1B
Eye Dam. 1	3.3/1	Serious eye damage, Category 1
Aquatic Acute 1	4.1/A1	Acute aquatic hazard, category 1
Aquatic Chronic 1	4.1/C1	Chronic (long term) aquatic hazard, category 1

This safety data sheet has been completely updated in compliance to Regulation 2020/878.

This document was prepared by a competent person who has received appropriate training.

Main bibliographic sources:

ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre,  
Commission of the European Communities

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van  
Nostrand Reinold

The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.

It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.

This MSDS cancels and replaces any preceding release.