


<a href="#">Ruthenium Chloride Solution</a>	<a href="#">Pricing &gt;</a>
<a href="#">Ruthenium(III) Chloride Hydrate</a>	<a href="#">Pricing &gt;</a>

<b>Linear Formula</b>	RuCl <sub>3</sub> •xH <sub>2</sub> O
<b>Pubchem CID</b>	6185
<b>MDL Number</b>	MFCD00011208
<b>EC No.</b>	233-167-5
<b>IUPAC Name</b>	Trichlororuthenium
<b>Beilstein/Reaxys No.</b>	N/A
<b>SMILES</b>	Cl[Ru](Cl)Cl
<b>Inchl Identifier</b>	InChI=1S/3ClH.Ru/h3*1H;/q;;;+3/p-3
<b>Inchl Key</b>	YBCAZPLXEGKKFM-UHFFFAOYSA-K

<b>Signal Word</b>	Danger
<b>Hazard Statements</b>	H314
<b>Hazard Codes</b>	C
<b>Precautionary Statements</b>	P280-P305 + P351 + P338-P310
<b>Flash Point</b>	Not applicable
<b>Risk Codes</b>	34
<b>Safety Statements</b>	26-36/37/39-45
<b>RTECS Number</b>	N/A
<b>Transport Information</b>	UN 3260 8 / PGII
<b>WGK Germany</b>	3
<b>GHS Pictograms</b>	<b><u>GHS05</u></b> <b><u>Corrosive</u></b> 

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## SAFETY DATA SHEET

Date Accessed: 05/05/2024

Date Revised: 01/15/2022

## SECTION 1. IDENTIFICATION

**Product Identifiers:** All applicable American Elements product codes for CAS #14898-67-0

**Relevant identified uses of the substance:**  
Scientific research and development

Supplier details:  
American Elements  
10884 Weyburn Ave.  
Los Angeles, CA 90024  
Tel: +1 310-208-0551  
Fax: +1 310-208-0351

Emergency telephone number:  
Domestic, North America +1 800-424-9300  
International +1 703-527-3887

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## SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS05 Corrosion

Met. Corr. 1

H290 May be corrosive to metals.

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Eye Dam. 1

H318 Causes serious eye damage.

GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Hazards not otherwise classified

No information known.

Label elements

GHS label elements

The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms



GHS05 GHS07

Signal word

Danger

Hazard statements

H290 May be corrosive to metals.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

Precautionary statements

P260

Do not breathe dusts or mists.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/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.

P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P405

Store locked up.

P501

Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification

D1B - Toxic material causing immediate and serious toxic effects

D2B - Toxic material causing other toxic effects

E - Corrosive material

Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

Health (acute effects) = 3

Flammability = 0

Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT:

Not applicable.

vPvB:

Not applicable.

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### **SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical characterization: Substances

CAS# Description:

14898-67-0 Ruthenium(III) chloride hydrate

Identification number(s):

EC number: 233-167-5

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### **SECTION 4. FIRST AID MEASURES**

Description of first aid measures

General information

Immediately remove any clothing soiled by the product.

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.  
After eye contact  
Rinse opened eye for several minutes under running water. Then consult a doctor.  
After swallowing  
Seek medical treatment.  
Information for doctor  
Most important symptoms and effects, both acute and delayed  
Causes severe skin burns.  
Harmful if swallowed.  
Causes serious eye damage.  
Indication of any immediate medical attention and special treatment needed  
No further relevant information available.

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## **SECTION 5. FIREFIGHTING MEASURES**

Extinguishing media  
Suitable extinguishing agents  
Carbon dioxide, extinguishing powder or water spray.  
Fight larger fires with water spray or alcohol resistant foam.  
Special hazards arising from the substance or mixture  
If this product is involved in a fire, the following can be released:  
Hydrogen chloride (HCl)  
Ruthenium oxide  
Advice for firefighters  
Protective equipment:  
Wear self-contained respirator.  
Wear fully protective impervious suit.

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## **SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures  
Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation  
Environmental precautions:  
Do not allow product to reach sewage system or any water course.  
Methods and material for containment and cleaning up:  
Use neutralizing agent.  
Dispose of contaminated material as waste according to section 13.

Ensure adequate ventilation.  
Prevention of secondary hazards:  
No special measures required.  
Reference to other sections  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.  
Protective Action Criteria for Chemicals  
PAC-1:  
Substance is not listed.  
PAC-2:  
Substance is not listed.  
PAC-3:  
Substance is not listed.

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## **SECTION 7. HANDLING AND STORAGE**

### Handling

Precautions for safe handling  
Handle under dry protective gas.  
Keep container tightly sealed.  
Store in cool, dry place in tightly closed containers.  
Ensure good ventilation at the workplace.  
Information about protection against explosions and fires:

No information known.

Conditions for safe storage, including any incompatibilities

### Storage

Requirements to be met by storerooms and receptacles:

No special requirements.

Information about storage in one common storage facility:

Store away from water/moisture.

Store away from strong bases.

Store away from oxidizing agents.

Store away from metals.

Further information about storage conditions:

Store under dry inert gas.

This product is hygroscopic.

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

Protect from humidity and water.

Specific end use(s)

No further relevant information available.

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## **SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information:

No data

Exposure controls

Personal protective equipment

General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

Breathing equipment:

Use suitable respirator when high concentrations are present.

Recommended filter device for short term use:

Use a respirator with type P100 (USA) or P3 (EN 143) cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards.

Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Material of gloves

Nitrile rubber, NBR

Penetration time of glove material (in minutes)

480

Glove thickness:

0.11 mm

Eye protection:

Tightly sealed goggles

Full face protection

Safety glasses with side shields / NIOSH (US) or EN 166(EU)

Body protection:

Protective work clothing.

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## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

General Information

Appearance:

Form: Crystalline or powder

Odor: Not determined

Odor threshold: Not determined.

pH-value: Not applicable.

Change in condition

Melting point/Melting range: 100 °C (212 °F) (dec)

Boiling point/Boiling range: Not determined

Sublimation temperature / start: Not determined

Flammability (solid, gaseous)

Not determined.

Ignition temperature: Not determined

Decomposition temperature: Not determined

Auto igniting: Not determined.

Danger of explosion: Not determined.

Explosion limits:

Lower: Not determined

Upper: Not determined

Vapor pressure: Not applicable.

Density: Not determined

Relative density

Not determined.

Vapor density

Not applicable.

Evaporation rate

Not applicable.

Solubility in / Miscibility with Water: Soluble

Partition coefficient (n-octanol/water): Not determined.

Viscosity:

dynamic: Not applicable.

kinematic: Not applicable.

Other information

No further relevant information available.

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## SECTION 10. STABILITY AND REACTIVITY

Reactivity

No information known.

Chemical stability

Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided:

Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions

Reacts with strong oxidizing agents

Conditions to avoid

No further relevant information available.

Incompatible materials:

Bases

Oxidizing agents

Metals

Water/moisture

Hazardous decomposition products:

Hydrogen chloride (HCl)

Ruthenium oxide

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## **SECTION 11. TOXICOLOGICAL INFORMATION**

Information on toxicological effects

Acute toxicity:

Harmful if swallowed.

Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification:

No data

Skin irritation or corrosion:

Causes severe skin burns.

Eye irritation or corrosion:

Causes serious eye damage.

Sensitization:

No sensitizing effects known.

Germ cell mutagenicity:

No effects known.

Carcinogenicity:

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

Reproductive toxicity:

No effects known.

Specific target organ system toxicity - repeated exposure:

No effects known.

Specific target organ system toxicity - single exposure:

No effects known.

Aspiration hazard:

No effects known.

Subacute to chronic toxicity:

No effects known.

Additional toxicological information:

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.



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## **SECTION 12. ECOLOGICAL INFORMATION**

Toxicity

Aquatic toxicity:

No further relevant information available.

Persistence and degradability

No further relevant information available.

Bioaccumulative potential

No further relevant information available.

Mobility in soil

No further relevant information available.

Additional ecological information:

General notes:

Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.

May cause long lasting harmful effects to aquatic life.

Avoid transfer into the environment.

Results of PBT and vPvB assessment

PBT:

Not applicable.

vPvB:

Not applicable.

Other adverse effects

No further relevant information available.

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## **SECTION 13. DISPOSAL CONSIDERATIONS**

Waste treatment methods

Recommendation

Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation:

Disposal must be made according to official regulations.

Recommended cleansing agent:

Water, if necessary with cleansing agents.

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## **SECTION 14. TRANSPORT INFORMATION**

UN-Number

DOT, IMDG, IATA

UN3260

UN proper shipping name

DOT

Corrosive solid, acidic, inorganic, n.o.s.

(Ruthenium(III) chloride hydrate)

ADR

3260 Corrosive solid, acidic, inorganic, n.o.s.

(Ruthenium(III) chloride hydrate)  
IMDG, IATA  
CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.  
(Ruthenium(III) chloride hydrate)  
Transport hazard class(es)  
DOT  
Class  
8 Corrosive substances  
Label  
8  
ADR  
Class  
8 (C2) Corrosive substances  
Label  
8  
IMDG, IATA  
Class  
8 Corrosive substances  
Label  
8  
Packing group  
DOT, ADR, IMDG, IATA  
III  
Environmental hazards:  
Not applicable.  
Special precautions for user  
Warning: Corrosive substances  
EMS Number: F-A,S-B  
Segregation groups  
Acids  
Stowage Category  
A  
Transport in bulk according to Annex II of  
MARPOL73/78 and the IBC Code  
Not applicable.  
Transport/Additional information:  
DOT  
Quantity limitations  
On passenger aircraft/rail: 25 kg  
On cargo aircraft only: 100 kg  
Marine Pollutant (DOT):  
No  
IMDG  
Limited quantities (LQ)  
5 kg  
Excepted quantities (EQ)  
Code: E1  
Maximum net quantity per inner packaging: 30 g  
Maximum net quantity per outer packaging: 1000 g  
UN "Model Regulation":  
UN 3260 CORROSIVE SOLID, ACIDIC, INORGANIC,  
N.O.S. (RUTHENIUM(III) CHLORIDE HYDRATE), 8,  
III

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## **SECTION 15. REGULATORY INFORMATION**

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

GHS label elements

The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms

GHS05

GHS07

Signal word

Danger

Hazard statements

H290 May be corrosive to metals.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

Precautionary statements

P260

Do not breathe dusts or mists.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/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.

P301+P330+P331 If swallowed: Rinse mouth. Do NOT induce vomiting.

P405

Store locked up.

P501

Dispose of contents/container in accordance with local/regional/national/international regulations.

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)  
Substance is not listed.

California Proposition 65

Prop 65 - Chemicals known to cause cancer  
Substance is not listed.

Prop 65 - Developmental toxicity  
Substance is not listed.

Prop 65 - Developmental toxicity, female  
Substance is not listed.

Prop 65 - Developmental toxicity, male  
Substance is not listed.

Information about limitation of use:

For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations  
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.  
Substance is not listed.  
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.  
Substance is not listed.  
Annex XIV of the REACH Regulations (requiring Authorisation for use)  
Substance is not listed.  
Chemical safety assessment:  
A Chemical Safety Assessment has not been carried out.

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## **16. OTHER INFORMATION**

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. American Elements shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.

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