

## 1 Identification

· **Product identifier**

· **Product Name:** 1000 µg/mL Ruthenium

· **Part Name:**

PLRU3-2Y

PLRU3-2M

PLRU3-2X

· **Application of the substance / the mixture** Certified Reference Material

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

· **Manufacturer/Supplier:**

Spex CertiPrep, LLC.

203 Norcross Ave, Metuchen,

NJ 08840 USA

732-549-7144

USMet-CRMSales@antylia.com

· **Information department:** product safety department

· **Emergency telephone number:**

Emergency Phone Number (24 hours)

CHEMTREC (800-424-9300)

Outside US: 703-527-3887

## 2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS05 Corrosion

Eye Damage 1

H318 Causes serious eye damage.



GHS07

Skin Irritation 2

H315 Causes skin irritation.

Specific Target Organ Toxicity - Single Exposure 3 H335 May cause respiratory irritation.

· **Label elements**

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS05



GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**

hydrochloric acid

· **Hazard statements**

H315 Causes skin irritation.

H318 Causes serious eye damage.

H335 May cause respiratory irritation.

· **Precautionary statements**

P261 Avoid breathing dust/fume/gas/mist/vapors/spray

P264 Wash thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear eye protection / face protection.

P302+P352 If on skin: Wash with plenty of water.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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.

P321 Specific treatment (see on this label).

P362+P364 Take off contaminated clothing and wash it before reuse.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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- Classification system:
- NFPA ratings (scale 0 - 4)



- HMIS-ratings (scale 0 - 4)



- Other hazards
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

### 3 Composition/information on ingredients

- Chemical characterization: Mixtures
- Description: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:

7647-01-0	hydrochloric acid	10.0%
· Chemical identification of the substance/preparation		
7732-18-5	water, distilled, conductivity or of similar purity	89.74%
13815-94-6	Ruthenium (III) chloride trihydrate	0.26%

### 4 First-aid measures

- Description of first aid measures
- General information: Immediately remove any clothing soiled by the product.
- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Immediately rinse with water.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Do not give anything to eat or drink - Do not induce vomiting
- Information for Doctor:
- Most important symptoms and effects, both acute and delayed No further relevant information available.
- Indication of any immediate medical attention and special treatment needed No further relevant information available.

### 5 Fire-fighting measures

- Extinguishing media
- Suitable extinguishing agents: Use fire fighting measures that suit the environment.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

### 6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures Wear protective equipment. Keep unprotected persons away.
- Environmental precautions:  
Dilute with plenty of water.  
Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Use neutralizing agent.  
Dispose contaminated material as waste according to section 13.  
Ensure adequate ventilation.
- 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-I:

7647-01-0	hydrochloric acid	1.8 ppm
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· <b>PAC-2:</b>		
7647-01-0	hydrochloric acid	22 ppm
· <b>PAC-3:</b>		
7647-01-0	hydrochloric acid	100 ppm

### 7 Handling and storage

- **Handling:**
- **Precautions for safe handling**  
Ensure good ventilation/exhaustion at the workplace.  
Prevent formation of aerosols.
- **Information about protection against explosions and fires:** No special measures required.
- **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:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s)** No further relevant information available.

### 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

7647-01-0 hydrochloric acid	
PEL	Ceiling limit value: 7 mg/m <sup>3</sup> , 5 ppm
REL	Ceiling limit value: 7 mg/m <sup>3</sup> , 5 ppm
TLV	Ceiling limit value: 2 ppm
	A4

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**  
Keep away from foodstuffs, beverages and feed.  
Immediately remove all soiled and contaminated clothing.  
Wash hands before breaks and at the end of work.  
Avoid contact with the eyes.  
Avoid contact with the eyes and skin.
- **Respiratory protection:**  
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
- **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.  
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.  
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of gloves**  
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
- **Penetration time of glove material** The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:**



Tightly sealed goggles

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### 9 Physical and chemical properties

· <b>Information on basic physical and chemical properties</b>	
· <b>General Information</b>	
· <b>Appearance:</b>	
Form:	Liquid
Color:	According to product specification
· Odor:	Characteristic
· Odour Threshold:	Not applicable.
· pH-value:	Not applicable.
· <b>Change in condition</b>	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	100 °C (212 °F)
· Flash point:	Not applicable.
· Flammability (solid, gaseous):	Not applicable.
· Decomposition temperature:	Not applicable.
· Ignition temperature:	Product is not selfigniting.
· Danger of explosion:	Product does not present an explosion hazard.
· <b>Explosion limits:</b>	
Lower:	Not applicable.
Upper:	Not applicable.
· Vapor pressure at 20 °C (68 °F):	23 hPa (17.3 mm Hg)
· Density	Not applicable.
· Relative density	Not applicable.
· Vapor density	Not applicable.
· Evaporation rate	Not applicable.
· <b>Solubility in / Miscibility with</b>	
Water:	Fully miscible.
· <b>Partition coefficient (n-octanol/water):</b> Not applicable.	
· <b>Viscosity:</b>	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· <b>Solvent content:</b>	
Water:	89.7 %
VOC content:	0.00 %
Solids content:	0.0 %
· Other information	No further relevant information available.

### 10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

### 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:**  
Caustic effect on skin and mucous membranes.  
Irritant to skin and mucous membranes.
- **on the eye:** Strong irritant with the danger of severe eye injury.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**  
The product shows the following dangers according to internally approved calculation methods for preparations:  
Irritant

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· **Carcinogenic categories**

· <b>IARC (International Agency for Research on Cancer)</b>	7647-01-0   hydrochloric acid	3
· <b>NTP (National Toxicology Program)</b>	None of the ingredients is listed.	
· <b>OSHA-Ca (Occupational Safety &amp; Health Administration)</b>	None of the ingredients is listed.	

**12 Ecological information**

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**  
Water hazard class 1 (Self-assessment): slightly hazardous for water  
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.  
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

**13 Disposal considerations**

- **Waste treatment methods**
- **Recommendation:** Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

**14 Transport information**

· <b>UN-Number</b>	
· <b>DOT, ADR, IMDG, IATA</b>	UN1789
· <b>UN proper shipping name</b>	
· <b>DOT</b>	Hydrochloric acid
· <b>ADR</b>	1789 HYDROCHLORIC ACID
· <b>IMDG, IATA</b>	HYDROCHLORIC ACID
· <b>Transport hazard class(es)</b>	
· <b>DOT</b>	
· <b>Class</b>	8 Corrosive substances
· <b>Label</b>	8
· <b>ADR, IMDG, IATA</b>	
· <b>Class</b>	8 Corrosive substances
· <b>Label</b>	8
· <b>Packing group</b>	
· <b>DOT, ADR, IMDG, IATA</b>	II
· <b>Environmental hazards:</b>	Not applicable.

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<ul style="list-style-type: none"> <li>· <b>Special precautions for user</b></li> <li>· <b>Hazard identification number (Kemler code):</b></li> <li>· <b>EMS Number:</b></li> <li>· <b>Segregation groups</b></li> <li>· <b>Stowage Category</b></li> <li>· <b>Segregation Code</b></li> </ul>	<p>Warning: Corrosive substances</p> <p>80</p> <p>F-A,S-B</p> <p>(SGG1) Acids</p> <p>C</p> <p>SG36 Stow "separated from" SGG18-alkalis.</p> <p>SG49 Stow "separated from" SGG6-cyanides</p>
<ul style="list-style-type: none"> <li>· <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b> Not applicable.</li> </ul>	
<ul style="list-style-type: none"> <li>· <b>Transport/Additional information:</b></li> </ul>	
<ul style="list-style-type: none"> <li>· <b>ADR</b></li> <li>· <b>Excepted quantities (EQ)</b></li> </ul>	<p>Code: E2</p> <p>Maximum net quantity per inner packaging: 30 ml</p> <p>Maximum net quantity per outer packaging: 500 ml</p>
<ul style="list-style-type: none"> <li>· <b>IMDG</b></li> <li>· <b>Limited quantities (LQ)</b></li> <li>· <b>Excepted quantities (EQ)</b></li> </ul>	<p>1L</p> <p>Code: E2</p> <p>Maximum net quantity per inner packaging: 30 ml</p> <p>Maximum net quantity per outer packaging: 500 ml</p>
<ul style="list-style-type: none"> <li>· <b>UN "Model Regulation":</b></li> </ul>	<p>UN 1789 HYDROCHLORIC ACID, 8, II</p>

### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture** No further relevant information available.
- **Sara**

<ul style="list-style-type: none"> <li>· <b>Section 313 (Specific toxic chemical listings):</b></li> </ul>	7647-01-0   hydrochloric acid
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<ul style="list-style-type: none"> <li>· <b>TSCA (Toxic Substances Control Act):</b></li> </ul>	7732-18-5   water, distilled, conductivity or of similar purity	ACTIVE
	7647-01-0   hydrochloric acid	ACTIVE

<ul style="list-style-type: none"> <li>· <b>Hazardous Air Pollutants</b></li> </ul>	7647-01-0   hydrochloric acid
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· **Proposition 65**

<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause cancer:</b></li> </ul>	None of the ingredients is listed.
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<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause reproductive toxicity for females:</b></li> </ul>	None of the ingredients is listed.
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<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause reproductive toxicity for males:</b></li> </ul>	None of the ingredients is listed.
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<ul style="list-style-type: none"> <li>· <b>Chemicals known to cause developmental toxicity:</b></li> </ul>	None of the ingredients is listed.
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· **Carcinogenic categories**

<ul style="list-style-type: none"> <li>· <b>EPA (Environmental Protection Agency)</b></li> </ul>	None of the ingredients is listed.
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<ul style="list-style-type: none"> <li>· <b>TLV (Threshold Limit Value)</b></li> </ul>	7647-01-0   hydrochloric acid	A4
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<ul style="list-style-type: none"> <li>· <b>NIOSH-Ca (National Institute for Occupational Safety and Health)</b></li> </ul>	None of the ingredients is listed.
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- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS05

GHS07

- **Signal word** Danger

- **Hazard-determining components of labeling:**  
hydrochloric acid

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**· Hazard statements**

- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H335 May cause respiratory irritation.

**· Precautionary statements**

- P261 Avoid breathing dust/fume/gas/mist/vapors/spray
- P264 Wash thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P280 Wear eye protection / face protection.
- P302+P352 If on skin: Wash with plenty of water.
- P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- 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.
- P321 Specific treatment (see on this label).
- P362+P364 Take off contaminated clothing and wash it before reuse.
- P332+P313 If skin irritation occurs: Get medical advice/attention.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P405 Store locked up.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**· Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**· Department issuing SDS:** product safety department

**· Contact:**

Spex CertiPrep, LLC.  
1-732-549-7144

**· Date of preparation / last revision** 07/12/2023

**· Abbreviations and acronyms:**

- ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- VOC: Volatile Organic Compounds (USA, EU)
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit
- REL: Recommended Exposure Limit
- Skin Irritation 2: Skin corrosion/irritation – Category 2
- Eye Damage 1: Serious eye damage/eye irritation – Category 1
- Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3