

## RUTHENIUM - HCl

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### SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

#### 1.1 Product Identifier

Product form Liquid  
Chemical Name RUTHENIUM - HCl  
Index No. Mixture  
EC No. Mixture  
CAS No. Mixture

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

1.2.1 Relevant identified uses Laboratory Chemical  
1.2.2 Uses advised against No additional information available.

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

De Bruyn Spectroscopic Solutions  
70/145 Chattan Road  
Glenfernness  
Midrand, 2191 Gauteng  
South Africa

#### 1.4 Emergency telephone number

RSA: 086 100 0366  
Namibia: 080 010 0366  
Other: Local Emergency Services.

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

*Classification Regulation (EC) No 1272/2008 (CLP):*

Met cor. 1 H290  
Skin Irr. 2, H315  
Eye Irr 2A, H319  
STOT SE, 3, H335

Full text of hazard classes and H statements: see Section 16.

#### **Adverse physicochemical, human health and environmental effects:**

May be corrosive to metals. Causes skin irritation. Causes severe eye irritation. May cause respiratory irritation.

#### 2.2 Label Elements

*Labelling (Regulation (EC) No 1272/2008*

Hazard Pictograms:



Signal word: WARNING

#### Hazard Statements:

H290 – May be corrosive to metals.  
H315 – Causes skin irritation.  
H319 – Causes severe eye irritation.  
H335 – May cause respiratory irritation.

#### Precautionary Statements:

P261 - Do not breathe mist, vapour, fume, or spray.  
P271 – Use only outdoors or in a well-ventilated area.  
P264 - Wash hands, forearms, and face thoroughly after handling.  
P280 - Wear protective gloves/protective clothing/eye protection/face protection.

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P303+P361+P353 - IF ON SKIN (or hair): Immediately remove/take off 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 and continue rinsing.

P304+P340 – IF INHALED: remove to fresh air and keep at rest in a position suitable for breathing.

Components contributing to classification: Hydrochloric Acid,

Reduced Labelling (< = 125 ml)

Pictogram:



Signal Word: Warning

Hazard Statements:

Causes skin irritation and severe eye irritation.

May cause respiratory irritation.

Precautionary Statements: None

Supplemental Hazard Statements: none

### 2.3 Other hazards

#### ***Other hazards not contributing to the classification:***

This substance/mixture contains no components considered to be either persistent, bio accumulative and toxic (PBT), or very persistent and very bio accumulative (vPvB) at levels of 0.1% or higher.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substance

Not applicable.

### 3.2 Mixture

Name	Product Identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Hydrochloric acid	(CAS-No.) 7647-01-1 (EC-No.) 231-595-7 (EC Index-No.) 017-002-00-2	10	Met cor 1, H290; Skin Corr. 1B, H314; Eye dam 1, H318; STOT SE 3, H335
Ruthenium chloride	(CAS No.)148-67-0 (EC No.) 604-667-4	0.01 – 10000 µg/mL as Ru	Met cor, H290;Ac tox 4, H302; Skin Corr. 1B, H314; Eye dam 1, H318 ; Chr Aq tox 2, H411

Specific concentration limits: HCl  
(C ≥ 25%) Skin Corr. 1B, H314  
(10 ≤ C <25%) Skin Irr. 2, H315  
(10 ≤ C <25%) Eye irr. 2, H319  
(C ≥ 10%) STOT SE 3, H335

## SECTION 4: FIRST AID MEASURES

### 4.1 Description of First Aid Measures

#### **First aid measures general**

Call a physician if symptoms persist. First aiders need to protect themselves.

Remove person to fresh air and keep comfortable for breathing.

#### **First aid measures after inhalation**

Rinse skin with water/shower. Take off immediately all contaminated clothing. Call a doctor if symptom persist.

#### **First aid measures after skin contact**

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a doctor/physician if symptoms persist.

#### **First aid measures after eye contact**

Rinse mouth. Do not induce vomiting. Call a doctor/physician if feeling uncomfortable.

#### **First aid measures after ingestion**

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

#### **Symptoms/effects after inhalation**

May cause respiratory irritation.

#### **Symptoms/effects after skin contact**

Causes skin irritation.

#### **Symptoms/effects after eye contact**

Causes severe eye irritation.

#### **Symptoms/effects after ingestion**

May cause throat and digestive system irritation.

4.3 **Indication of any immediate medical attention and special treatment needed:**  
Treat symptomatically.

## SECTION 5: FIRE FIGHTING MEASURES

5.1 **Extinguishing media**  
Suitable extinguishing media Water spray. Dry powder. Foam. Carbon dioxide. Use water fog to control fumes.

5.2 **Special hazards arising from the substance or mixture**  
Fire hazard Product not combustible.  
Hazardous decomposition products in case of fire Toxic fumes may be released. Hydrogen chloride gas, chlorine.

5.3 **Advice for firefighters**  
Protection during firefighting Do not attempt to act without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

5.4 **Further Information**  
 Suppress (knock down) gases/vapours/mists with a water fog. Cool closed containers exposed to fire with water spray.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

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

6.1.1 **For non-emergency personnel**  
Emergency procedures Avoid substance contact. Do not breathe mist, vapour, fume, or spray.

6.1.2 **For emergency responders**  
Protective equipment Do not attempt to act without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2 **Environmental precautions**  
Avoid release to the environment.

6.3 **Methods and materials for containment and cleaning up**  
**Methods for cleaning up** Cover spill area with inert material to avoid spread. Neutralise with lime or soda ash. Flush area.  
**Other Information** Dispose of materials or solid residues at an authorized site.

6.4 **Reference to other sections**  
For further information refer to section 8, 13.

## SECTION 7: HANDLING AND STORAGE

7.1 **Precautions for safe handling**  
**Precautions for safe handling** Wear recommended personal protective equipment. See section 8. Avoid contact with eyes and skin. Do not breathe mist, vapour, fume, or spray.  
**Hygiene measures:** Handle in accordance with good industrial hygiene and safety practice. Immediately change contaminated clothing. Wash hands before breaks and at the end of workday. Do not eat, drink, or smoke while working.

7.2 **Conditions for safe storage, including any incompatibilities**  
**Storage conditions** Store in a cool, dry, well-ventilated area. Keep out of direct sunlight and away from heat, water, and incompatible materials. Keep containers tightly closed.  
**Incompatible materials** Oxidizing agents, bases, metals, organic compounds. Corrosive to mild steel.  
**Packaging** Polyethylene, polypropylene, polyvinyl chloride.

7.3 **Specific end users**  
No additional information.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Exposure Limits

<b>Hydrochloric Acid (CAS: 7647-01-1)</b>		
United Kingdom	WEL STEL (Gas and mist) WEL TWA (Gas and mist)	5 ppm / 8 mg/m <sup>3</sup> 1 ppm / 2 mg/m <sup>3</sup>
South Africa; HCA Regulations (Restricted Limit)	TWA (8Hour) (Gas and mist)	4 ppm

### 8.2 Exposure controls

#### Appropriate engineering controls

Ensure availability of eye wash and shower in work area. Engineering measures are preferred to reduce exposure

#### Personal protective equipment

Protective gloves PVC, rubber

##### Hand protection

Tightly fitting safety goggles/face mask

##### Eye protection

Acid resistant protective clothing,

##### Skin and body protection

In case of inadequate ventilation, use appropriate respiratory protection.

##### Respiratory protection



#### Environmental exposure controls

Avoid release to the environment.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

Product form	Liquid
Appearance	Clear colourless
Odour	Pungent
Odour threshold	No data available
pH	<1 @ 20°C
Relative evaporation rate (butylacetat e= 1)	No data available
Melting point/Freezing Point	-17°C
Initial Boiling point	102°C (at 1.013 hPa)
Flash point	Not applicable
Auto-ignition temperature	Not applicable
Flammability (solid, gas)	Not applicable
Vapour pressure	No data available
Vapour density	No data available
Relative vapour density @ 20°C	No data available
Density	1.05 g/cm <sup>3</sup> @ 20°C
Solubility (water)	Miscible
Log Pow	No data available
Viscosity, kinematic	No data available
Viscosity, dynamic	No data available
Explosive properties	Not classified as explosive
Explosive limits	Not applicable
Oxidising properties	None

### 9.2 Additional information

No additional data available.

## SECTION 10: STABILITY AND REACTIVITY

### 10.1 Reactivity

The product is non-reactive under recommended conditions of use, storage and transport.

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

The product reacts with metals with release of highly flammable hydrogen gas. Reacts with alkalies with evolution of heat. Reacts with oxidizers generating toxic chlorine gas. Reacts with cyanides or sulphides generating toxic hydrogen cyanide or hydrogen sulphide gas.

### 10.4 Conditions to avoid

Heat, direct sunlight, contact with common metals, alkali metals, incompatible products.

### 10.5 Incompatible materials

Bases, amines, alkali metals, metals, oxidizers.

### 10.6 Hazardous decomposition products

When heated to decomposition, emits hydrogen chloride gas and will react with water or steam to produce heat and toxic, corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects:

Acute toxicity (oral)	Product does not meet classification criteria.
Acute toxicity (Dermal)	Product does not meet classification criteria.
Acute toxicity (Respiratory)	Product does not meet classification criteria.

#### Ruthenium chloride (CAS: 148-67-0)

LD50 (Oral)	501 mg/kg
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Skin corrosion/irritation:	Causes skin irritation.
Serious eye damage/irritation	Causes severe eye irritation
Respiratory or skin sensitisation	Not classified
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive toxicity	Not classified.
STOT-SE	May cause respiratory irritation.
STOT RE	Not classified
Aspiration hazard	Not classified

### 11.2 Additional Information

#### Endocrine disrupting properties

This substance/mixture contains components considered to have endocrine disrupting properties affecting human health, according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100: None

## SECTION 12: ECOLOGICAL INFORMATION

### 12.1 Toxicity

Ecology - general	Before neutralisation, the product may represent a danger to aquatic organisms.
Acute aquatic toxicity	Product does not meet classification criteria.
Chronic aquatic toxicity	Product does not meet classification criteria.

#### Ruthenium chloride (CAS: 148-67-0)

Chr Aq Category 2	Toxic to aquatic life with long lasting effects.
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### 12.2 Persistence and degradability

Not applicable for inorganic compounds.

### 12.3 Bioaccumulative potential

Not applicable for inorganic compounds.

### 12.4 Mobility

Mobile.

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## 12.5 Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bio accumulative or toxic (PBT), or very persistent and very bio accumulative (vPvB) at levels of 0.1% or higher.

## 12.6 Endocrine disrupting properties

Assessment This substance/mixture contains components considered to have endocrine disrupting properties for environment , according to REACH Article 57(f), Commission Regulation (EU) 2018/605 or Commission Delegated Regulation (EU) 2017/2100: None

## 12.7 Other adverse effects

No additional information.

## SECTION 13: DISPOSAL CONSIDERATIONS

### Waste treatment methods: Product and packaging

The generation of waste should be avoided or minimised wherever possible. This material and packaging must be disposed of in a safe way in consultation with licensed waste disposal company in accordance with local legal requirements.

## SECTION 14: TRANSPORT INFORMATION

In accordance with ADR / IMDG / IATA

	ADR	IMDG	IATA	Class diamond
UN Number	1789	1789	1789	
Proper Shipping Name	HYDROCHLORIC ACID	HYDROCHLORIC ACID	HYDROCHLORIC ACID	
Hazard Class	8	8	8	
Subsidiary hazard class	-	-	-	
Packing Group	II	II	II	
Marine pollutant	No	No	No	

Limited/Excepted quantity: 1L

## SECTION 15: REGULATORY INFORMATION

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

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

#### Authorisations and/or restrictions on use:

This product does not contain any substance listed on Annex XIV of the REACH Regulation (EC) Nr. 1907/2006. Regulation (EU) 2019/1148 on the marketing and use of explosives precursors: None

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) : No restrictions.

#### National Regulations:

Occupational Health and Safety Act 85 of 1993.

Hazardous Chemical Agents Regulations.

SANS 10228, 10229, 10232-4.

### 15.2 Chemical Safety Assessment

No chemical safety assessment has been carried out.

## SECTION 16: OTHER INFORMATION

Full text of R-, H- and EUH-statements:

Sk irr. Cat 2, H315	Skin irritation, Category 2, Causes skin irritation
Eye irr. Cat 2A, H319	Eye irritation, Category 2A, Causes severe eye irritation
Sk cor. Cat 1B, H314	Skin corrosion, Category 1B, Causes seveverskin burns.
Eye Dam 1, H318	Eye Damage Category 1, Causes serious eye damage
Met.Cor. 1, H290	Metal corrosion Category 1, May cause metal corrosion.
STOT SE, 3, H335	Specific target organ toxicity, single exposure, May cause respiratory irritation.
Ac tox 4, H302	Acute toxicity, Category 4, Harmful if swallowed
Chr Aq tox 2, H411	Chronic aquatic toxicity, Category 2, Toxic to aquatic life with long lasting effects.
WEL STEL	Workplace Exposure Limit; Short term Exposure Limit
TWA	Time weighted average

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Revision history	Changes	Date
Revision 2.0	Document updated to GHS format.	30-09-2024