Section 1: Company and Product Identification

Product Name: Ruthenium (III) Chloride Hydrate

Product Code: 8002

Company: Colonial Metals, Inc.
Building 20
505 Blue Ball Road
Elkton, MD 21921 United States
Company Contact: EHS Director
Telephone Number: 410-398-7200
FAX Number: 410-398-2918
E-Mail: info@colonialmetals.com
Web Site: www.colonialmetals.com

Emergency Supplier Emergency Contacts & Phone Number
Response: Chembic: 800-424-9300
World Wide - Call COLLECT to U.S: 703-527-3887

Section 2: Hazards Identification

Hazard Pictograms: !

Signal Word: Danger

Hazard Category: Serious eye damage/eye irritation Cat 1
Skin corrosion/irritation Cat 1
Acute tox, inh. Cat 4
Acute tox, dermal Cat 5
Acute tox, oral Cat 4

Hazard Statements:
H318: Causes serious eye damage
H314: Causes severe skin burns and eye damage
H332: Harmful if inhaled
H313: May be harmful in contact with skin
H302: Harmful if swallowed

Precautionary Statements:
P301+310: IF SWALLOWED: Immediately call a POISON CENTER or
P337+313: IF exposed or concerned: Get medical advice/attention

Conditions Aggravated By Exposure:
May cause irritation of the respiratory system. Maintain housekeeping and personal hygiene to minimize exposure and prevent sensitization.

Hazards not otherwise classified:
Conditions Aggravated By Overexposure:
To the best of our knowledge, the chemical, the physical, and toxicological properties have not been thoroughly investigated.

Section 3: Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous substance (name)</th>
<th>Hazard Category</th>
<th>CAS#</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruthenium (III) Chloride Hydrate</td>
<td>Corrosive</td>
<td>14898-67-0</td>
<td>99.9 - 100</td>
</tr>
<tr>
<td>Chemical Family: Metal halide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Formula: RuCl3.xH2O</td>
<td>Synonyms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruthenium trichloride</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 4:  First Aid Measures

**General Info:** Consult a Physician. Show this safety data sheet to the doctor in attendance.

**Notable Exposure Symptoms:**

**If ingested:** Rinse mouth. Seek immediate medical attention. Clear the airway and administer artificial respiration if not breathing. If swallowed, do not induce vomiting unless directed to do so by medical personnel.

**If inhaled:** Remove the victim from the contaminated area while protecting yourself from exposure by wearing an appropriate respirator. Put a similar respirator on the victim if possible. Get medical attention immediately.

**Eye contact:** Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do. Get immediate medical attention.

**Skin contact:** Flush area for 15 minutes with water and wash with soap and water. If discomfort occurs or persists, contact a physician. Remove contaminated clothing and shoes and wash before reuse.

Section 5:  5. Fire Fighting Measures

**General Info:** No usual fire or explosion hazards

**Extinguishing Method / Equipment:** No usual fire or explosion hazards. In case of fire use dry chemical.

**Hazardous Decomposition Info:** Constituents associated with burning / combustion are to be considered toxic. Firefighters should wear self-contained breathing apparatus and full protective gear.

Section 6: 6. Accidental Release Measures

**Personal precautions, protective equipment and procedures:** Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate respiratory protective equipment and clothing during clean-up. Avoid breathing dust. Ventilate area if easy to do so. Contact local authorities if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Containment Equipment and Procedures:**

**Large Spills:** Contain actively spilling material if safe and easy to do so. Do not let product enter drains.

**Small Spills:** can be mixed with vermiculite or sodium carbonate and swept up

**Cleanup Procedures:** Contain spillage and then collect with an electrically protected vacuum cleaner or by wet brushing and place in container for disposal according to local regulations.

Section 7: Handling and Storage

**Safe Handling Precautions:** Do not handle until all safety precautions have been read and understood. Keep containers tightly closed. Ensure adequate ventilation. Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment and wash thoroughly after handling. Keep away from ignition sources.

**Recommendations for Storage:** Store in cool, dry area in a tightly closed product container away from sources of ignition or flame.

**Incompatibilities:** Store away from strong acids or oxidizing agents. Refer to Section 10.

Section 8: Exposure Control / Personal Protection

**General / Ventilation:** Local Exhaust: Required in handling area

**Engineering Mechanical:** Desirable to insure concentration of material below TLV/TWA levels

**Controls:** Other: Closed Ventilation system - Dust (Laboratory Fume Hood)

**Work Clothing:** Protective work clothing which covers skin and prevents exposures.

**Eye/face protection:** Wear safety glasses with side shields or goggles or face shield.

**Skin Protection:** Wear chemical resistant gloves.
Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN(EU).

Additional Information: Observe good chemical hygiene practices. Do not smoke or eat while using this product. Wash hands or exposed skin after using the product.

Section 9: Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Solid Powder</td>
</tr>
<tr>
<td>Melting Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Color</td>
<td>Black Powder</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>N/A</td>
</tr>
<tr>
<td>Odor</td>
<td>May have strong Chlorine Odor</td>
</tr>
<tr>
<td>Molecular Wt.</td>
<td>207.43 (anhydro us)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>3.11 g/cm3</td>
</tr>
<tr>
<td>Upper Flam Limits</td>
<td>N/A</td>
</tr>
<tr>
<td>Lower Flam Limits</td>
<td>N/A</td>
</tr>
<tr>
<td>VOC Content (lbs/gal)</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Soluble</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Part. Coeff (n-octanol/water)</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>N/A</td>
</tr>
<tr>
<td>Autoignition Temp</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Section 10: Stability and Reactivity

General: This product is stable and non-reactive under normal conditions of use. Product is not subject to hazardous polymerization. Avoid open flame and ignition sources.

Stability: Hygroscopic

Conditions to Avoid: Material may absorb water from the atmosphere on prolonged exposure.

Incompatible materials:

Decomposition: Hydrogen chloride and chlorine.

Section 11: Toxicological Information

General Information: To the best of our knowledge the chemical, physical, and toxicological effects of this compound have not been thoroughly investigated.

Toxicological Information (product):

Likely Routes of Exposure: Eye Contact, Skin Contact, Inhalation. Ingestion - possible, but considered unlikely.

Toxicological Information (contained substances)

Carcinogenicity or mutagenicity: have not been thoroughly investigated.

Sensitization: Product is not expected to be a sensitizer.

Other Notes: None

Section 12: Ecological Information

General information: No data available

Aquatic toxicity: No data available

Degradation / Mobility info: No specific data available.

Bioaccumulative potential: No specific data available.
Section 13: Disposal Information


Container disposal: Treat empty containers with extra care. Consult waste contractor.

Other considerations: No further information.

Section 14: Transport Information

DOT: Proper Shipping Name
Corrosive solid, acidic, inorganic, n.o.s.
Hazard Class
8
Secondary Hazard Class
PG II
DOT Identification Number
UN3260
DOT Shipping Label
Corrosive solid, acidic, inorganic, n.o.s.
Freight Class
See 40 CFR
Packaging Exceptions
See 40 CFR
Packaging Requirements
See 40 CFR

IMO/IMDG: No data available

IATA: Proper Shipping Name: Corrosive solid, acidic, inorganic, n.o.s.
IATA UN#: 3260
Hazard Class: 8
Packaging Group: II

Comments: None

Section 15: Regulatory Information

TSCA: Listed in the TSCA inventory as RuCl3 (CAS# 10049-08-8).

SARA 313 This product does not contain any ingredients regulated under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 or 40 CFR 372.

Canadian DSL: This product has been classified in accordance with the hazard criteria of CPR, and the MSDS contains all the information required by the CPR.

European Union (EU) Symbol of Danger: C
Regulatory Information: Indication of Danger: Corrosive
Risk Phrase: Causes burns.
S: 26 36/37/39 45
Safety Phrase: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately. (show the label where possible

Other International Regulations: US Classification and Label Text
Indication of Danger: Corrosive
Risk Phrase: Causes burns.
Safety Phrase: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately. (show the label where possible.
## NFPA Rating
- Health: 3
- Fire: 0
- Reactivity: 0
- COR

## HMIS Rating
- Health: 3
- Fire: 0
- Reactivity: 0
- Personal Protection: C

## Precautionary Label
- Corrosive

**Disclaimer:** In compliance with the OSHA Hazard communication Standard, 29 C.F.R 1910.1200, we are providing you with a Materials Safety Data Sheet (MSDS) for the hazardous material you are purchasing.

It is your responsibility to educate your employees on the safe use of the hazardous material. With this in mind, a copy should be forwarded to the supervisor of the user or to the user themselves, and copy should be retained in your files for future reference.

Colonial Metals, Inc. makes no presentation as to the accuracy of the information in the MSDS. The information is believed to be correct; however, you (the customer), should perform your own investigation and independent verification. If you resell the product, you are responsible to forward the information in the MSDS to your customer.

Colonial Metals, Inc.

**SDS Author:** John Kerchner  
**Version Date:** 7/30/2015