


# MATERIAL SAFETY DATA SHEET

## Ruthenium (IV) Oxide Anhydrous

|  |  |        |   |              |   |            |   |                     |   |
|--|--|--------|---|--------------|---|------------|---|---------------------|---|
| <b>NFPA</b><br> | <b>HMIS</b><br><table border="1"><tr><td>HEALTH</td><td style="text-align: center;">2</td></tr><tr><td>FLAMMABILITY</td><td style="text-align: center;">0</td></tr><tr><td>REACTIVITY</td><td style="text-align: center;">0</td></tr><tr><td>PERSONAL PROTECTION</td><td style="text-align: center;">C</td></tr></table> | HEALTH | 2 | FLAMMABILITY | 0 | REACTIVITY | 0 | PERSONAL PROTECTION | C |
| HEALTH   | 2  |        |   |              |   |            |   |                     |   |
| FLAMMABILITY   | 0  |        |   |              |   |            |   |                     |   |
| REACTIVITY   | 0  |        |   |              |   |            |   |                     |   |
| PERSONAL PROTECTION  | C  |        |   |              |   |            |   |                     |   |

### 1. Product And Company Identification

|   |   |
|---|---|
| <b>Supplier</b><br>Colonial Metals, Inc.<br>Building 20<br>505 Blue Ball Road<br>Elkton, MD 21921 United States<br><br>Company Contact: Joseph Fittos III<br>Telephone Number: 410-398-7200<br>FAX Number: 410-398-2918<br>E-Mail: jfittos@colonialmetals.com<br>Web Site: colonialmetals.com | <b>Manufacturer</b><br>Colonial Metals, Inc.<br>Building 20<br>505 Blue Ball Road<br>Elkton, MD 21921 United States<br><br>Company Contact: Joseph Fittos III<br>Telephone Number: 410-398-7200<br>FAX Number: 410-398-2918<br>E-Mail: jfittos@colonialmetals.com<br>Web Site: colonialmetals.com |
|---|---|

|   |   |
|---|---|
| <b>Supplier Emergency Contacts &amp; Phone Number</b><br>Chemtrac: 800-424-9300<br>World Wide - Call COLLECT to U.S: 703-527-3887 | <b>Manufacturer Emergency Contacts &amp; Phone Number</b><br>Chemtrac: 800-424-9300<br>World Wide - Call COLLECT to U.S: 703-527-3887 |
|---|---|

**Issue Date:** 02/23/2007

**Product Name:** Ruthenium (IV) Oxide Anhydrous  
**Chemical Name:** Ruthenium (IV) Oxide Anhydrous/ Ruthenium Oxide  
**CAS Number:** 12036-10-1  
**Chemical Family:** Platinum Group Metal Salts  
**Chemical Formula:** RuO<sub>2</sub>  
**MSDS Number:** 8004  
**Product Code:** 8004

### 2. Composition/Information On Ingredients

| Ingredient Name   | CAS Number | Percent Of Total Weight |
|-------------------|------------|-------------------------|
| Ruthenium Dioxide | 12036-10-1 | 99 - 100                |

### EMERGENCY OVERVIEW

**Danger! Causes eye irritation. May cause respiratory and digestive tract irritation. May cause skin irritation. Hygroscopic (absorbs moisture from the air).  
Target Organs: Eyes.**

**Product incompatible with organics, especially acetone and alcohol.**

### 3. Hazards Identification

**Primary Routes(s) Of Entry**

Eye: Likely  
Inhalation: Likely  
Skin: Likely

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## Ruthenium (IV) Oxide Anhydrous

### 3. Hazards Identification - Continued

#### Primary Routes(s) Of Entry - Continued

Ingestion: Likely

#### Eye Hazards

Dust may cause mechanical irritation. Causes eye irritation. May cause permanent corneal opacification. May cause chemical conjunctivitis.

#### Skin Hazards

Irritation

#### Ingestion Hazards

May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause burns to the gastrointestinal tract.

Does not cause serious toxic manifestations

#### Inhalation Hazards

Inhalation of dust may cause respiratory tract irritation. May cause acute pulmonary edema, asphyxia, chemical pneumonitis, and upper airway obstruction caused by edema.

#### Chronic/Carcinogenicity Effects

Effects may be delayed.

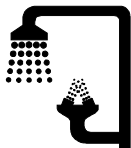
#### Conditions Aggravated By Exposure

Causes eye irritation. May cause respiratory and digestive tract irritation. May cause skin irritation. Hygroscopic (absorbs moisture from the air). May cause irritation to the respiratory system. Maintain housekeeping and personal hygiene to minimize exposure and prevent sensitization.

#### Conditions Aggravated By Overexposure

To the best of our knowledge, the chemical, the physical, and toxicological properties have not been thoroughly investigated.

### First Aid (Pictograms)



### 4. First Aid Measures

#### Eye

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

#### Skin

. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If discomfort continues get medical aid. Wash clothing before reuse.

#### Ingestion

Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

#### Inhalation

Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

# MATERIAL SAFETY DATA SHEET

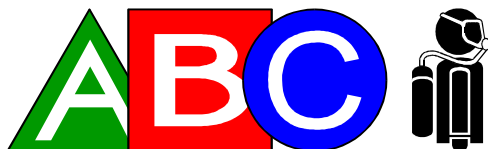
## Ruthenium (IV) Oxide Anhydrous

### 4. First Aid Measures - Continued

#### Note To Physician

Treat symptomatically and supportively.

### Fire Fighting (Pictograms)



### 5. Fire Fighting Measures

Flash Point: NA °F NA °C

Flash Point Method: NA

Autoignition Point: NA °F NA °C

Flammability Class: NA

Lower Explosive Limit: NA

Upper Explosive Limit: NA

#### Fire And Explosion Hazards

Can ignite by spontaneous combustion in the presence of organics.

#### Extinguishing Media

Use water spray, dry chemical, carbon dioxide, or appropriate foam. Do not use organics.

#### Fire Fighting Instructions

As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

### 6. Accidental Release Measures

Sweep or soak up and place in sealed container. Taking care to avoid dusting. Person protected with full face shield and proper respirator and cartridge for dust. Ventilate area and wash spill site after pick-up is complete.

### 7. Handling And Storage

#### Handling And Storage Precautions

Avoid contact with eyes, prolonged or repeated contact with skin. Avoid breathing dust. Use compatible chemical resistant gloves. Wash hands thoroughly after handling.

#### Handling Precautions

Wash thoroughly after handling. Use only in a well-ventilated area. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation.

#### Storage Precautions

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

#### Other Precautions

0.01 ppm high efficiency particular respirator/supplied air respirator/self-contained breathing apparatus; 0.2 ppm same as above with full face piece; 1 ppm powdered air purifying respirator with high efficiency filter/type C supplied air respirator operated in pressure demand mode. Store in a sealed container, plastic or plastic liner, in a cool, well ventilated, dry area away from volatile acids.

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## Ruthenium (IV) Oxide Anhydrous

### Protective Clothing (Pictograms)



### 8. Exposure Controls/Personal Protection

#### Engineering Controls

Ventilation: Local Exhaust: Required in handling area  
Mechanical: Desirable to insure concentration of material below TLV/TWA levels  
Other: Closed Ventilation system - Dust (Laboratory Fume Hood)

#### Eye/Face Protection

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

#### Skin Protection

Wear appropriate protective gloves to prevent skin exposure.

#### Respiratory Protection

NIOSH approved chemical cartridge respiratory for particulates and dust or self-contained breathing apparatus with full face shield.

#### Other/General Protection

Lab coat/apron, flame and chemical resistant protective clothing, eye wash, safety shower, and hygiene facilities for washing.

### 9. Physical And Chemical Properties

#### Appearance

Black powder

#### Odor

Odorless

**Chemical Type:** Mixture

**Physical State:** Solid

**Melting Point:** Decomposes °C

**Boiling Point:** NA °C

**Specific Gravity:** 6.97

**Molecular Weight:** 133.07

**Vapor Pressure:** NA

**Vapor Density:** NA

**pH Factor:** NA

**Solubility:** Insoluble

**Evaporation Rate:** NA

### 10. Stability And Reactivity

**Stability:** Stable

**Hazardous Polymerization:** Will not occur

#### Conditions To Avoid (Stability)

Dust generation, excess heat, exposure to moist air or water. Mixing with organics.

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## Ruthenium (IV) Oxide Anhydrous

### 10. Stability And Reactivity - Continued

#### Incompatible Materials

Oxidizing agents, acetone, alcohols, organics, moisture, reducing agents.

#### Hazardous Decomposition Products

Ruthenium Oxide

### 11. Toxicological Information

#### Chronic/Carcinogenicity

Not listed by ACGIH, IARC, NTP, or CA Prop 65.

RTECS#:

CAS# 12036-10-1: VM2654000

LD50/LC50:

CAS# 12036-10-1:

Oral, mouse: LD50 = 5570 mg/kg;

Oral, rat: LD50 = 4580 mg/kg

.

### 12. Ecological Information

No Data Available...

### 13. Disposal Considerations

Consult Federal EPA, State and local regulations for proper disposal/recycle/reclamation

NOTE: Chemical additions, processing, or otherwise altering this material may make the waste management information presented above incomplete, inaccurate, or otherwise inappropriate.

#### RCRA Information

NL

### 14. Transport Information

No Data Available...

### 15. Regulatory Information

#### U.S. Regulatory Information

TSCA

CAS# 12036-10-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants.

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## Ruthenium (IV) Oxide Anhydrous

### 15. Regulatory Information - Continued

#### U.S. Regulatory Information - Continued

This material does not contain any Class 1 Ozone depleters.

This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed as Priority Pollutants under the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12036-10-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

#### Canadian Regulatory Information

Canada - DSL/NDSL

CAS# 12036-10-1 is listed on Canada's DSL List.

Canada - WHMIS

not available.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

#### European Union (EU) Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI

Risk Phrases:

R 36 Irritating to eyes.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 39 Wear eye/face protection.

### 16. Other Information

#### NFPA Rating

Health: 2

Fire: 0

Reactivity: 0

Other: COR

#### HMIS Rating

Health: 2

Fire: 0

Reactivity: 0

Personal Protection: C

#### Revision/Preparer Information

MSDS Preparer: Joseph J. Fittos III

MSDS Preparer Phone Number: 410-398-7200

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## Ruthenium (IV) Oxide Anhydrous

### 16. Other Information - Continued

#### Revision/Preparer Information - Continued

**This MSDS Supersedes A Previous MSDS Dated:** 08/21/2003

#### **Disclaimer**

In compliance with the OSHA Hazard Communication Standard, 2.9 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.

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