

## SPI Supplies Division

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Manufacturer's CAGE: 1P573

## Safety Data Sheet

Date Effective: August 24, 2016

02596-AB, 02596-CF

SPI-Chem™ Ruthenium Oxide (IV) Hydrate

Component of 02592-AA, 02592-AB SPI-Chem™  
Ruthenium Tetroxide Staining Kit

### Section 1.1: Identification

Chemical Name/Synonyms ..... Ruthenium Oxide Hydrate

Product or Trade Name ..... SPI-Chem™ Ruthenium Oxide (IV) Hydrate

CAS #'s ..... 32740-79-7

Chemical Formula..... RuO<sub>2</sub>·xH<sub>2</sub>O

### Section 1.2: Relevant Uses/Restrictions

Laboratory chemical for use as precursor for a stain for electron microscopy.

### Section 1.3: Supplier of the Safety Data Sheet

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### Section 1.4: Emergency telephone number

Emergencies

Contacting CHEMTREC:

24 Hour Emergency Use Only #'s...

Worldwide phone: 1-(703)-741-5970

Toll-free phone: 1-(800)-424-9300 USA + Canada only

### Section 2: Hazard Identification

2.1 Classification of the substance

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Acute toxicity, oral (Category 5)

Skin corrosion / irritation (Category 2)

Serious eye irritation (category 3)

Specific target organ toxicity, single exposure (Category 3) (respiratory irritant)

## 2.2 Label elements

Pictogram



Signal Word: Warning

Hazard statements:

- H303: May be harmful if swallowed.
- H315: Causes skin irritation.
- H320: Causes eye irritation.
- H335: May cause respiratory irritation.

Precautionary statements:

- P260: Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
- P264: Wash skin thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P271: Use only outdoors or in a well-ventilated area.
- P272: Contaminated work clothing should not be allowed out of the workplace.
- P280: Wear eye protection / face protection.
- P284: Wear respiratory protection.
- P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
- P337 + P313: If eye irritation persists: Get medical advice / attention.

## 2.3 Other Hazards:

To the best of our knowledge, the chemical, the physical, and the toxicological properties of this compound have not been thoroughly investigated.  
Oxidation of ruthenium compounds may form toxic, volatile ruthenium tetroxide.

Hazardous Material Information System USA

Health ..... 1  
Fire Hazard ..... 0  
Reactivity ..... 0  
Personal Protection ..... J

NFPA Rating (estimated)

Health ..... 1  
Flammability ..... 0  
Reactivity ..... 0

## **Section 3: Composition**

### 3.1 Substances:

Hazardous substance	Hazard Category	CAS#	Weight %
Ruthenium (IV) Oxide Hydrate	irritant	32740-79-7	78.7

## **Section 4: First Aid Measures**

### **4.1 Description of first aid measures:**

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

**Notable exposure symptoms:** Irritation to skin, eyes and areas of contact.

#### **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.

Contact a physician immediately.

Remove contaminated clothing and shoes and wash before reuse.

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

No additional relevant information available.

### **4.3 Indication of any immediate medical attention and special treatment needed**

No additional relevant information available.

## **Section 5: Fire Fighting Measures**

### **5.1 Extinguishing media:**

Use extinguishing media appropriate for surrounding fire conditions.

Quench with large quantities of water.

Use water spray to cool fire exposed containers.

Do not direct a solid stream of water or foam into burning molten material as

This may cause spattering and spread the fire.

### **5.2 Special hazards arising from the substance or mixture:**

No additional relevant information.

Hazardous combustion products: Not known.

### 5.3 Advice for firefighters:

Use NIOSH / MSHA approved self-contained breathing apparatus and full protective clothing.

Special protective equipment and precautions for firefighters:

No additional relevant information.

## **Section 6: Accidental Release Measures**

### 6.1 Personal precautions:

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.

### 6.2 Environmental precautions:

Contain actively spilling material if safe and easy to do so.

Do not let product enter drains.

### 6.3 Methods and material for containment and cleaning up:

Sweep up and place in a proper vessel for recovery or disposal.

Avoid raising dust.

Ventilate and wash spill site after cleanup is complete.

Contain spillage and then collect with an electrically protected vacuum cleaner or by wet

Brushing and place in a container for disposal according to local regulations.

### 6.4 Reference to other sections:

For personal protection, see Section 8 of the SDS.

## **Section 7: Handling and Storage**

### 7.1 Precautions for safe handling:

Do not handle until all safety precautions have been read and understood.

Protective measures:

Keep containers tightly closed.

Ensure adequate ventilation.

Avoid breathing dust/vapor.

Avoid contact with eyes, skin, and clothing.

Avoid prolonged exposure.

Advice on general hygiene conditions:

Wear appropriate personal protective equipment.

Wash thoroughly after handling.

Keep away from ignition sources.

Keep away from heat and direct sunlight.

### 7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry area in a tightly closed container away from sources of ignition or flame. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Incompatibilities: Organics, especially acetone and alcohol. Strong oxidizing agents.

### 7.3 Specific end uses

Laboratory chemical for use as precursor for a stain for electron microscopy.

SPI Supplies products are offered for laboratory, teaching and manufacturing use only and under no circumstances are they being offered for clinical or medical use.

## **Section 8: Exposure Controls and Personal Protection**

### 8.1 Control parameter and Personal Protection

#### Workplace exposure limits

Contains no substances with occupational exposure limit values.

### 8.2 Exposure controls

#### 8.2.1 General 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).

#### 8.2.2 Individual protection measures:

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: NIOSH approved chemical cartridge respirator for particulates

And dust or self-contained breathing apparatus with full face shield.

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.

#### 8.2.3 Environmental exposure controls

No additional relevant information available.

## **Section 9: Physical and Chemical Properties**

### 9.1 Information on basic physical and chemical properties

Appearance: Solid, black powder

Odor: Not available

Odor threshold: Not available

pH: Not available

Melting point/Freezing point: Not available

Boiling point/Boiling point range: Not available

Flash Point: Not available

Evaporation rate: Not available

Flammability (solid, gas): Not available  
Upper/lower flammability or explosive limits: Not available  
Vapor Pressure: Not available  
Vapor density: Not available  
Relative density: Not available  
Specific Gravity: ~7.0 grams/centimeter<sup>3</sup>  
Solubility: Insoluble in water  
Partition coefficient (n-octanol/water): Not available  
auto-ignition temperature: Not available  
Decomposition temperature: Not available  
Viscosity: Not available  
Explosive properties: Not available  
Oxidizing Properties: Not available  
Molecular Weight: 160.07

#### 9.2 Other information

No additional relevant information available.

### **Section 10: Stability and Reactivity**

10.1 Reactivity: This product is stable and non-reactive under normal conditions of use.

10.2 Chemical Stability: Stable

10.3 Possibility of Hazardous Reactions: Product is not subject to hazardous polymerization.

10.4 Conditions to avoid: Mixing with organics. Avoid open flame and ignition sources.

10.5 Incompatible materials: Organics, especially acetone and alcohol; active metals

10.6 Hazardous decomposition products: Not known

### **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.

### **Section 12: Ecological Information**

General Information: No data available.

## **Section 13: Disposal Considerations**

### 13.1 Waste treatment methods

Product Disposal: Place in a sealed container. 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.

## **Section 14: Transport Information**

DOT: Considered non-hazardous for shipping.

IATA: Same as DOT 49 CFR regulations; Consult IATA before shipping.

## **Section 15: Regulatory Information**

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

RCRA: Not listed

SARA 302 Components: Not listed

SARA 313 Components: Not listed

State Right-To-Know Lists:

CAS# 32740-79-7 is listed in the Pennsylvania and New Jersey Right-To-Know Lists.

California Prop. 65 Components:

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

### 15.2 Chemical Safety Assessment

Date of Preparation: 24 August 2016

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

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)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bio-accumulative and Toxicological

vPvB: very Persistent and very Bio-accumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

STEL: Short Term Exposure Limit

## **Section 16: Other Information**

### **Disclaimer of Liability:**

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues or fluids.

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