

## Material Safety Data Sheet

Identity: Ruthenium

Formula: Ru

### SECTION I - GENERAL INFORMATION

Manufacturer: [Stanford Advanced Materials](#) (SAM)

The information below is believed to be accurate and represents the best information available to SAM. However, SAM makes no warranty, expressed or implied with respect to such information and assumes no liability resulting from its use.

### SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Molecular weight: 101.07

CAS #	OSHA PEL	ACGIH TLV	%
7440-18-8	N/A	1.0mg/m <sup>3</sup>	100

### SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: 4150.0 °C

Vapor Pressure (vs. air or mmHg): 9.8mmHg

Melting Point: 2334.0 °C

Density: 12.45g/cm<sup>3</sup>

Evaporation Rate: N/A

Flash Point: N/A:

Solubility in water: Insoluble

*Appearance and odor:* Grey powder and pieces, odorless

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

*Explosive Limits:* LEL: N/A

UEL: N/A

*Extinguishing Media:*CO<sub>2</sub>, Foam and Dry Chemical. Do NOT use water*Special Fire Fighting Procedures:*

Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

*Unusual Fire and Explosion Hazards:*

May emit toxic fumes upon decomposition

### SECTION V - REACTIVITY DATA

*Stability:* Stable

*Conditions to Avoid (stability):* Extreme Heat

*Incompatibility:* Oxidizers, aqua regia

*Hazardous Decomposition or Byproducts:* toxic fumes

*Hazardous Polymerization:* Will not occur

*Conditions to avoid (hazardous polymerization):* None

#### SECTION VI - HEALTH HAZARD DATA

*Carcinogenicity:* NTP? N/A

IARC Monographs? N/A

OSHA Regulated? N/A

*Medical Conditions Aggravated by Exposure:* Pre-existing respiratory problems and/or allergies

#### Emergency and First Aid Procedures:

*Inhalation:* Remove victim to fresh air, keep warm and quiet, and give oxygen if breathing is difficult; seek medical attention

*Ingestion:* Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person

*Skin:* Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water, and seek medical attention if symptoms persist

*Eye:* Flush eyes with lukewarm water, lifting upper and lower eyelids for at least 15 minutes and seek medical attention

#### SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

#### *Steps to be taken in case material is released or spilled:*

Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

#### *Waste disposal method:*

Call and/or ship to precious metal refiner

#### *Hazard Label Information:*

Store in cool, dry area and in tightly sealed container. Wash thoroughly after handling.

#### SECTION VIII - CONTROL MEASURES

#### *Protective Equipment Summary (Hazard Label Information):*

NIOSH approved respirator, impervious rubber gloves, safety glasses, clothes to prevent contact.

#### *Ventilation:*

Local Exhaust: To maintain concentration at low exposure levels.

Mechanical (General): Recommended.

#### *Work/Hygienic/Maintenance Practices:*

Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating