

E0221

Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831

IBO-MSDS-04997

MATERIAL SAFETY DATA SHEET

The issuance of this document complies with the U. S. Department of Labor, Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.

<u>Definitions:</u>	<u>ACGIH</u>	American Conference of Governmental Industrial Hygienists	
	<u>NIOSH</u>	National Institute for Occupational Safety and Health	
	<u>NE</u>	Not Established	<u>NISS</u> Not In Sources Searched
	<u>NA</u>	Not Applicable	<u>TLV</u> Threshold Limit Value
	<u>TWA</u>	Time Weighted Average	<u>PEL</u> Permissible Exposure Limit

2006

IDENTITY (As used on label and list): Ruthenium (-96, -98, -99, -100, -101, 102, -104) Metal Powder

SECTION I. Manufacturer's Identification

Manufacturer's Name:

UT-Battelle
 c/o Oak Ridge National Laboratory
 Isotope Business Office
 P. O. Box 2008
 Oak Ridge, Tennessee 37831

Emergency Telephone Number:

Lab Shift Superintendent (865) 574-6606

Telephone Number for Assistance:

Isotope Business Office (865) 574-6984

Date Prepared: 06-March-1987

Date Reviewed: 25-July-2003

SECTION II. Hazardous Ingredients/Identity Information

Exposure Limits:

OSHA:

ACGIH TLV:

NIOSH:

Immediately Dangerous to Life and Health:

Chemical Formula:

Ru

NE

NE

NE

NE

CAS Registry Number:

007440-18-8

RTECS Number:

NISS

DOT Class:

4.1, Flammable Solid

DOT Label:

Flammable Solid

DOT Number:

UN 3089

Health Hazard Rating:

1, slight health hazard

Fire Hazard Rating:

1, slightly flammable

Reactivity Rating:

0, nonreactive

SECTION III. Physical/Chemical Characteristics

Physical Description:

Silvery-white, hard metal.

Molecular Weight (naturally occurring):

101.07

Melting Point:

2450°C

Boiling Point:

4150°C

Specific Gravity:

12.45 (water=1)

Evaporation Rate:

NISS

Vapor Pressure:

NISS

Vapor Density:

NISS

Percent Volatiles:

NISS

Solubility:

Insoluble in water.

SECTION IV. Fire and Explosion Hazard Data

Flash Point (method):

NISS

Autoignition Temperature:

NISS

Lower Flammability Limit:

NISS

Upper Flammability Limit:

NISS

Extinguishing Media:

Extinguishing media suitable for surrounding materials.

Firefighting Procedures:

Firefighting techniques should concentrate on controlling the spread of the fire to other combustible materials. Wear pressure-demand, self-contained breathing apparatus and full firefighting protective clothing.

Fire and Explosion Hazards:

Moderate fire hazard in form of dust when exposed to heat or flame. When heated, it oxidizes readily in air producing irritant effects on the eyes and respiratory tract.

SECTION V. Reactivity Data

Stability:

Unstable: _____

Stable: X

Conditions to Avoid:

Heat when in dust form.

Incompatibility (materials to avoid):

Oxygen difluoride.

Hazardous Decomposition or Byproducts:

NISS

Hazardous Polymerization:

May Occur: _____

Will Not Occur: X

SECTION VI. Health Hazard Data

Routes of Entry: Inhalation: NISS Skin: _____ Ingestion: _____

Signs and Symptoms of Exposure:

Acute Inhalation: NISS
Acute Swallowing: NISS
Acute Skin Contact: Irritant
Acute Eye Contact: Irritant
Chronic: NISS

Health Hazards (Target organs/systems):

Acute: Eyes, skin (cutaneous hazard), respiratory system.
Chronic: NISS

Emergency and First Aid Procedures:

Inhalation: Remove to fresh air. No emergency care anticipated.
Swallowing: Induce vomiting only after massive ingestion.
Skin contact: Remove contaminated clothing and wash skin with plenty of water for at least 15 minutes. Get medical aid.
Eye contact: Flush eyes at once with water for at least 15 minutes. Get medical aid.
Physicians' notes: NISS

Carcinogenicity: NTP No IARC Monographs No OSHA Regulated No

Medical Conditions Generally Aggravated by Exposure: NISS

SECTION VII. Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: Notify safety personnel of leaks or spills. Remove spills by vacuuming or wet sweeping in order to keep airborne dust at a minimum.

Waste Disposal Method: Collect in an appropriate container for salvage or disposal. Treat unsalvageable waste as a toxic solid in accordance with federal, state, and local regulations.

Precautions to be Taken in Handling and Storing: Store in closed container in a cool, dry, well-ventilated, low fire-risk area. Protect container from physical damage.

Other Precautions: Avoid breathing dust. Avoid skin and eye contact. Eyewash stations and washing facilities should be accessible to areas of use.

SECTION VIII. Control Measures

Respiratory Protection (specify type): Use a NIOSH-approved inorganic dust respirator when dust levels are high.

Ventilation:

Local Exhaust: Employ to keep dust levels low.
Mechanical (general): Employ to keep dust levels low.
Special: NISS
Other: NISS

Protective Gloves: Compatible chemical resistant gloves.

Eye Protection: Wear approved chemical safety goggles/glasses.

Other Protective Clothing or Equipment: Wear protective clothing.

Work/Hygienic Practices: Wash thoroughly after handling.

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