



SAFETY DATA SHEET

Identity: Rhenium

Formula: Re

SECTION I - GENERAL INFORMATION

Manufacturer: Super Conductor Materials, Inc.

The information below is believed to be accurate and represents the best information available to Super Conductor Materials, Inc. However, SCM 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: 186.207

CAS #	OSHA PEL	ACGIH TLV	%
7440-15-5	NE	NE	0.0-100.0

SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: 5900.00°C

Vapor Pressure (vs. air or mmHg):

Melting Point: 3180.00°C

Density: 21.02 g/cm³

Evaporation Rate: NA

Flash Point: N/A

Solubility in water: Insoluble

Appearance and odor: Gray to black in powder form, silvery-white and lustrous as a solid, no odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

Method Used: Non-flammable

Explosive Limits: LEL: N/A

UEL: N/A

Extinguishing Media: Use suitable extinguishing agent for surrounding material and type of fire

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:

Flammable in the form of dust and powder when exposed to heat or flame.

Violent reaction with fluorine at 125C.

Ignites in oxygen at 300C.

Contact with acids can generate flammable hydrogen gas.



SECTION V - REACTIVITY DATA

Stability: Stable

Conditions to Avoid (stability): None expected

Incompatibility (materials to avoid): Fluorine, oxygen and strong acids

Hazardous Decomposition or Byproducts: Hydrogen and oxides of rhenium

Hazardous Polymerization: Will not occur

Conditions to Avoid (Hazardous Polymerization): None

SECTION VI - HEALTH HAZARD DATA

Routes of entry: Inhalation? No Skin? No Eyes? No Ingestion? No Other? No

Rhenium: There are no reported cases of human toxicity. Experimentally, the Re^{3+} cation is more toxic than the ReO_4^- anion. Symptoms of Re^{3+} poisoning in rats are sedation, abdominal irritation and death from cardiovascular collapse. Symptoms of ReO_4^- toxicity in rats include severe sedation and ataxia, tonic convulsions and cardiovascular collapse. In cats, rhenium causes transient hypertension with tachycardia and transient auricular and ventricular fibrillations. In experimental animals, inhalation in rhenium dust causes pulmonary fibrosis. (Sax, Dangerous Properties of Industrial Materials, eighth edition) Rhenium is considered a rare earth metal. These metals are moderately to highly toxic. The symptoms of toxicity of the rare earth elements include writhing, ataxia, labored respiration, walking on the toes with arched back and sedation. The rare earth elements exhibit low toxicity by ingestion exposure. However, the intraperitoneal route is highly toxic while the subcutaneous route is poison to moderately toxic. The production of skin and lung granulomas after exposure to them requires extensive protection to prevent such exposure.

Signs and Symptoms of Overexposure:

Inhalation: May cause writhing, ataxia, labored respiration, walking on the toes with arched back and sedation.

Ingestion: No signs or symptoms recorded.

Skin: May cause redness and itching.

Eye: May cause redness, itching, burning and watering.

Health Hazards (Acute and Chronic):

Inhalation:

Acute: May cause irritation to the respiratory tract and mucous membrane. Dusts may cause asthma attacks and lung damage such as lung granulomas and pulmonary edema. Chronic: Prolonged or repeated inhalation may cause writhing, loss of muscle coordination, labored respiration, sedation hypotension and cardiovascular collapse.

Ingestion:

Acute: Low toxicity by ingestion.

Chronic: May affect the coagulation rate of the blood.

Skin:

Acute: May cause abrasive irritation.

Chronic: No chronic health effects recorded.



Eye:

Acute: May cause abrasive irritation.

Chronic: No chronic health effects recorded.

Target Organs: May affect the respiratory system and blood

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

Medical Conditions Aggravated by Exposure: Pre-existing respiratory disorder

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:

Dispose of in accordance with state, local, and federal regulations.

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 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 or smoking. Do not blow dust off clothing or skin with compressed air.

Please be advised that N/A can either mean Not Applicable or No Data Has Been Established