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SAFETY DATA SHEET

Identity: Cerium Formula: Ce

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: 140.12

CAS #	OSHA PEL	ACGIH TLV	%
7440-45-1	15mg/m3	10mg/m3	0.0-100.0%

SECTION III – PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: 3433.00 °C
Melting Point: 798.00°C
Evaporation Rate: N/A
Solubility in water: Reacts readily in moisture, slow in cold

Vapor Pressure (vs. air or mmHg): N/A
Specific Gravity(H_2O=1): 6.77 g/cm^3
Flash Point: N/A

Appearance and odor: Steel-gray to silver powder and pieces, no odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

Method Used: N/A *Explosive Limits*: LEL: N/A UEL: N/A
Extinguishing Media: Use class D or other metal extinguishing agent. 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:

-Strong reducing agent and highly reactive metal.
-Ignites spontaneously in air at 150 – 180 °F.

-Moderate explosion hazard in the form of dust when exposed to flame.
-Readily oxidizes in moist air at room temperature.
-Reacts with water, acids and alkalies to form flammable hydrogen gas.
-The metal or its alloys spark with friction.
-May have an explosive reaction with zinc.
-May have a very exothermic reaction with bismuth or antimony.
-Ignites when heated with phosphorus and silicon.
-May ignite on heating to 300 °F.

SECTION V - REACTIVITY DATA

Stability: Unstable
Conditions to Avoid (instability): Air and moisture
Incompatibility: Strong acids; water; moisture; zinc; antimony; bismuth; carbon dioxide; halogens; phosphorus; silicon; strong oxidizing agents.

Hazardous Decomposition or Byproducts: Hydrogen gas
Hazardous Polymerization: Will not occur
Conditions to avoid (hazardous polymerization): None

SECTION VI - HEALTH HAZARD DATA

Route of entry: Inhalation? Yes Ingestion? Yes Eyes? Yes Skin? Yes Other? No

Cerium: The greatest exposures are likely to be during manufacturing of cerium. Exposed workers have experienced sensitivity to heat; itching and skin lesions. Large doses to experimental animals have caused writhing, ataxia (loss of muscle coordination), labored respiration, sedation, hypotension and death by cardiovascular collapse. The salts of cerium increase the blood coagulation rate. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Cerium 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. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Signs and Symptoms of Overexposure:
Inhalation: May cause writhing, ataxia, labored respiration, and sedation.
Ingestion: May cause nausea, vomiting, diarrhea, abdominal burning and cramp-like pain.
Skin: May cause redness, itching and burning.
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. Large doses may cause writhing, loss of muscle coordination, labored respiration, sedation, hypotension and cardiovascular collapse.

Chronic: Prolonged or repeated inhalation may cause writhing, loss of muscle coordination, labored respiration, sedation, hypotension and cardiovascular collapse.

Ingestion:
Acute: May cause gastrointestinal irritation.
Chronic: May affect the coagulation rate of the blood.

Skin:
Acute: May cause irritation, rashes and skin granulomas.
Chronic: May cause dermatitis, sensitivity to heat, itching and skin lesions.

Eye:
Acute: May cause irritation.
Chronic: No chronic health effects recorded.

Target Organs: May affect the respiratory system, blood and skin.
Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No
Medical Conditions Aggravated by Exposure: Pre-existing respiratory disorders

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.
Cerium metal reacts with water and moisture. Handle and store in a controlled environment and inert gas such as argon.

SECTION VIII - CONTROL MEASURES

Protective Equipment Summary (Hazard Label Information):

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

Ventilation:

Local Exhaust: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Special: Handle in a controlled atmosphere
Mechanical (General): Not recommended
Other: Handle in an inert gas such as argon

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