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MATERIAL SAFETY DATA SHEET

Section 1- PRODUCT IDENTIFICATION
COMPOSITION
CeO₂

PRODUCT NAME
Cerium Oxide, Cerium Dioxide, Ceric Oxide, Ceria, Cerium III

Section 2- HAZARDOUS INGREDIENTS
Note: Products under normal conditions do not represent an inhalation, ingestion or contact health hazard.

<table>
<thead>
<tr>
<th>MATERIAL OR COMPONENT</th>
<th>CAS NUMBER</th>
<th>WT%</th>
<th>OSHA PEL (Mg/M³)</th>
<th>ACGIH TLV (MG/M³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerium Oxide</td>
<td>1306-38-3</td>
<td>100</td>
<td>10mg/ m³</td>
<td>10mg/m³</td>
</tr>
</tbody>
</table>

Section 3- PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS)
□ Liquid □ Solid □ Gas □ Other

APPEARANCE AND ODOR
Pale yellow, powder or pieces; odorless

MELTING POINT (BASE METAL)
2600 °C

SPECIFIC GRAVITY
7.132gm/cc

Section 4- FIRE AND EXPLOSION

Flash Point (Method Used) N/A

Flammable Limits Non-Flammable

LEL N.A.

UEL N.A.

EXTINGUISHING MEDIA
Use dry chemical, CO₂

SPECIAL FIRED FIGHTING PROCEDURES
Wear approved self-contaminated breathing apparatus and full protective clothing to prevent contact with skin and eyes.

Section 5- REACTIVITY DATA

STABILITY Stable

INCOMPATABILITY (MATERIALS TO AVOID)
Strong acids & strong bases.

CONDITIONS TO AVOID

Heat & incompatible materials

HAZARDOUS DECOMPOSITION PRODUCTS
Ce
Section 6- HEALTH HAZARD GUIDE

MAJOR EXPOSURE HAZARD

- Inhalation
- Skin
- Skin Absorption
- Eye Contact
- Ingestion

INHALATION: A respiratory irritant. Coughing, sneezing, difficulty breathing and pulmonary edema may occur. May irritate the mucous membranes of the nose and throat. May affect the central nervous system.

DERMAL: Possible irritation, inflammation and redness. May cause dermatitis.

EYE CONTACT: Possible irritation, inflammation and redness. Lanthanide salts cause blistering of cornea, and cause a diffused gray opacity, related to the amount of metal, which binds to the cornea.

OTHER: Rare earth elements usually have a high toxicity via interperitoneal route and are highly to moderately toxic via subcutaneous route. May act as an anticoagulant. Insoluble cerium oxides are non-toxic when ingested. Intravenous injection of CeCl₃ causes fatty liver degeneration, increased by liver levels of neutral fats, liver, mitochondrial damage, decreased liver glycogen levels and reduces detoxication capacity in rats. Parenteral injection of CeCl₃ has a cardio toxic effect in rats, disturbing cardiac contraction and rhythm. Causes calcification of soft tissue when injected subcutaneously.

EMERGENCY & FIRST AID PROCEDURES

INHALATION: Remove from exposed area to fresh air.

INGESTION: Give 1-2 glasses of water or milk to induce vomiting.

SKIN CONTACT: Brush material off skin. Wash affected area with soap and water.

Section 7- SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES

Wear full protective clothing and a self-containing breathing apparatus. Isolate the area of the spill and insure proper ventilation is available. Vacuum spill using a high efficiency unit and place in a container for proper disposal. Take care not to raise dust.

WASTE DISPOSAL METHODS

Observe all federal, state and local regulations when disposing.

Section 8- SPECIAL PROTECTION

RESPIRATORY

Wear NIOSH approved dust-mist-fume cartridge respirator.

VENTILATION

Local exhaust: Maintain exposure below TLV. Mechanical ventilation recommended. Handle in controlled atmosphere.

EYE PROTECTION & PROTECTIVE CLOTHING

Wear neoprene protective gloves. Use safety glasses for eye protection. Protective clothing recommended preventing contaminating clothing.

Section 9- SPECIAL PRECAUTIONS

Store in tightly closed container in a cool dry place. Wash hands and face thoroughly after handling.

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