# MATERIAL SAFETY DATA SHEET

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product code:</th>
<th>G1400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name:</td>
<td>GERMANIUM (IV) OXIDE</td>
</tr>
<tr>
<td>Chemical Name:</td>
<td>Germanium dioxide</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>Germania, Germanic acid, Germanium oxide</td>
</tr>
<tr>
<td>Recommended use:</td>
<td>No information available.</td>
</tr>
<tr>
<td>CAS #:</td>
<td>1310-53-8</td>
</tr>
<tr>
<td>Formula:</td>
<td>GeO2</td>
</tr>
<tr>
<td>RTECS #:</td>
<td>LY5240000</td>
</tr>
<tr>
<td>CI#:</td>
<td>Not available</td>
</tr>
<tr>
<td>Supplier:</td>
<td>Spectrum Chemicals and Laboratory Products, Inc. 14422 South San Pedro St. Gardena, CA 90248 (310) 516-8000</td>
</tr>
<tr>
<td>Emergency Telephone Number:</td>
<td>CHEMTREC: 1-800-424-9300</td>
</tr>
<tr>
<td>Contact Person:</td>
<td>Martin LaBenz (West Coast)</td>
</tr>
<tr>
<td>Contact Person:</td>
<td>Chris Terpak (East Coast)</td>
</tr>
</tbody>
</table>

## 2. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

WARNING!. May be harmful if swallowed. May cause skin irritation. May cause eye irritation. May cause irritation of respiratory tract.

<table>
<thead>
<tr>
<th>Odor:</th>
<th>Physical state:</th>
<th>Appearance:</th>
<th>Color:</th>
</tr>
</thead>
</table>

**OSHA Regulatory Status**  
This material is not considered hazardous by the OSHA Hazard Communication Standard (29 1910.1200)
2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Inhalation. Ingestion.

Acute Potential Health Effects:

Skin Contact:
May cause skin irritation.

Eye Contact:
Contact with eyes may cause irritation.

Inhalation:
May cause irritation of respiratory tract. May affect respiration. May cause loss of appetite.

Ingestion:
May be harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhoea. May cause loss of appetite. May affect the liver. It may affect the kidneys. It may affect the peripheral nervous system. May cause central nervous system effects. It may affect the brain. May affect the cardiovascular system. May affect respiration. May cause cyanosis. May affect the blood. It may affect metabolism.

Chronic Potential Health Effects:

<table>
<thead>
<tr>
<th>Component</th>
<th>Carcinogen Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>100</td>
</tr>
</tbody>
</table>


Teratogenic Effects: May cause birth defects (teratogenic effects) based on animal test data

Mutagenic Effects: No information available

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>1310-53-8</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126).
Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention if irritation develops. If skin irritation persists, call a physician.

Eye Contact: Flush eye with water for 15 minutes. Get medical attention if irritation occurs. If symptoms persist, call a physician.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician if necessary.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

Flashpoint (°C/°F): No information available.

Tested according to: Not available

Lower Explosion Limit (%): No information available

Upper Explosion Limit (%): No information available

Autoignition Temperature (°C/°F): Not applicable.

Suitable Extinguishing Media: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.

Hazardous Combustion Products: Not applicable

Specific hazards: The product is not flammable. This material is an inorganic dust/powder and will not create nor support conditions that would result in a dust explosion or fire.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Specific Methods: No information available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation.

Environmental Precautions:
Do not let product enter drains. Do not let this chemical enter the environment.
Methods for Cleaning Up:
Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapours/dust. Avoid dust formation. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Products:
Oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protective Equipment

Eye protection:
Safety glasses. Safety glasses with side-shields.

Skin and body protection:
Long sleeved clothing. Chemical resistant apron. Gloves.

Respiratory protection:
Wear respirator with dust filter.

Hygiene measures:
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

National occupational exposure limits

United States
U.S Occupational Exposure Limits:

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide - 1310-53-8</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Canada
Canada Occupational Exposure Limits:

<table>
<thead>
<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide 1310-53-8</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Product code: G1400
Product name: GERMANIUM (IV) OXIDE
9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid.

Odor: None.

Flash point (°C): Not applicable

Autoignition Temperature (°C/°F): No information available

Melting point/range(°C/°F): 1081-1091 °C /1977.8-1995.8 °F***

Density (g/cm3): 6.239 @ 25 °C***

Vapor density: No information available

Odor threshold (ppm): No information available

Solubility:
- Insoluble in water
- Insoluble in Hydrochloric acid
- Insoluble in Hydrofluoric acid
- Insoluble in Sodium Hydroxide solutions***

Particle coefficient (n-octanol/water): No information available

Color:
White.

Molecular/Formula weight: 104.59

Partition coefficient (n-octanol/water): No information available

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions

Conditions to avoid: Avoid dust formation. Incompatible materials.

Materials to avoid: Strong oxidising agents.

Hazardous decomposition products: No information available.

Possibility of Hazardous Reactions: No information available

Polymerization: Hazardous polymerisation does not occur

Corrosivity: No information available

Product code: G1400

Product name: GERMANIUM (IV) OXIDE
### 11. TOXICOLOGICAL INFORMATION

#### Acute Toxicity

**Component Information**

Germanium (IV) Oxide - 1310-53-8

<table>
<thead>
<tr>
<th>LD50/oral/rat</th>
<th>=</th>
<th>1250 mg/kg Oral LD50 Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50/oral/mouse</td>
<td>=</td>
<td>1250 mg/kg</td>
</tr>
<tr>
<td>LD50/dermal/rabbit</td>
<td>=</td>
<td>No information available</td>
</tr>
<tr>
<td>LD50/dermal/rat</td>
<td>=</td>
<td>No information available</td>
</tr>
<tr>
<td>LC50/inhalation/rat</td>
<td>=</td>
<td>&gt; 1420 mg/m³ Inhalation LC50 Rat 4 h</td>
</tr>
<tr>
<td>LC50/inhalation/mouse</td>
<td>=</td>
<td>No information available</td>
</tr>
<tr>
<td>Other LD50 or LC50 information</td>
<td>=</td>
<td>No information available</td>
</tr>
</tbody>
</table>

**Product Information**

| LC50/inhalation/rat | = | 1420 mg/m³ 4 h |
| LC50/inhalation/mouse | = | No information available |
| LD50/dermal/rabbit | = | No information available |
| LD50/dermal/rat | = | No information available |
| LD50/oral/mouse | = | 1250 mg/kg |

LD50/oral/rat | = | 1250 mg/kg |

**Local Effects**

**Skin irritation:**
May cause skin irritation.

**Eye irritation:**
Contact with eyes may cause irritation.

**Inhalation:**
May cause irritation of respiratory tract. May cause dyspnea (difficulty breathing or shortness of breath). May cause loss of appetite.

**Ingestion:**
May be harmful if swallowed. May cause digestive (gastrointestinal) tract irritation. May cause diarrhea. May cause loss of appetite. May affect respiration (respiratory depression). May cause cyanosis. May cause drooping of eyelids (ptosis). May affect the cardiovascular system (vasodilation). May affect liver. May affect urinary system (kidneys). It may affect the brain. May affect behavior/central nervous system (sedation, excitation, seizures, tremor, fatigue, somnolence, impairment of locomotor activity). It may affect the spleen. It may disturb water balance, which leads to hemoconcentration, hypotension, and hypothermia.

**Sensitization:**
No information available

**Chronic Toxicity**

---

**Product code:** G1400  
**Product name:** GERMANIUM (IV) OXIDE
Chronic Toxicity

Prolonged or repeated ingestion may cause nausea, vomiting, diarrhea. Prolonged or repeated ingestion may affect metabolism (cause anorexia, weight loss). Prolonged or repeated ingestion may cause lactic acidosis. Prolonged or repeated exposure may affect the heart. Prolonged or repeated ingestion may affect the liver, and kidneys. Prolonged or repeated ingestion may affect the brain. Prolonged or repeated ingestion may affect the peripheral nervous system (peripheral neuropathy - extremity numbness and tingling, muscle pains and weakness). Prolonged or repeated ingestion may affect the cardiovascular system. Prolonged or repeated ingestion may affect the blood (changes in white blood cell count). Prolonged or repeated ingestion may affect the blood (changes in red blood cell count). Prolonged or repeated ingestion may affect the blood (normocytic anemia). Prolonged or repeated ingestion may affect the blood (changes in serum composition). Prolonged or repeated inhalation may affect the kidneys. Prolonged or repeated inhalation may affect the liver.

Carcinogenic effects:

Not considered carcinogenic

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA HCS - Carcinogens</th>
<th>ACGIH - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Mutagenic Effects:

No information available

Reproductive Effects:

May cause adverse reproductive effects based on animal test data.

Teratogenic Effects:

May cause birth defects (teratogenic effects) based on animal test data.

Target Organs:


12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available.

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

Product code: G1400  Product name: GERMANIUM (IV) OXIDE
### 14. TRANSPORT INFORMATION

#### DOT

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**Un-No:** Not regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Packing Group:** None  
**Subsidiary Risk:** Not applicable  
**Marine Pollutant:** No data available  
**ERG No:** No information available  
**DOT RQ (lbs):** No information available

#### TDG (Canada)

**Un-No:** Not Regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Description:** No information available

#### ADR

**Un-No:** Not Regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Classification Code:** No information available  
**Description:** No information available  
**CEFIC Tremcard No:** No information available

#### IMO / IMDG

**Un-No:** Not Regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Subsidiary Risk:** No information available  
**Packing Group:** No information available  
**Description:** No information available  
**IMDG Page:** No information available  
**Marine Pollutant:** No information available  
**MFAG:** No information available  
**Maximum Quantity:** No information available

#### RID

**Un-No:** Not Regulated  
**Proper Shipping Name:** No information available  
**Hazard Class:** No information available  
**Packing Group:** No information available  
**Subsidiary Risk:** No information available  
**Classification Code:** No information available  
**Description:** No information available

#### ICAO

**Un-No:** Not Regulated

**Product code:** G1400  
**Product name:** GERMANIUM (IV) OXIDE
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

IATA
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>Present</td>
<td>Not present</td>
<td>KE-17600</td>
<td>1-706</td>
<td>Present</td>
<td>Present</td>
<td>215-180-8</td>
</tr>
</tbody>
</table>

U.S. Regulations


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
Non-controlled

Product code: G1400
Product name: GERMANIUM (IV) OXIDE
Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>Not Listed</td>
<td>Present</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germanium (IV) Oxide</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

EU Classification

R -phrase(s)
R22 - Harmful if swallowed.

S -phrase(s)
S46 - If swallowed, seek medical advice immediately and show this container or label.

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Xn - Harmful.

16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

Preparation Date: 13-Sep-2011

Reason for revision: Not applicable

Prepared by: Sonia Owen

Literature reference: No information available
All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user’s responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.