## 1. PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| Product Name | **Germanium, Enriched Germanium** |
| CAS No. | 7440-56-4 |
| RTECS No. | LY5200000 |
| Chemical Formula | Ge |
| Molecular Weight | 72.64 g/mol |
| Supplier Address* | ISOFLEX USA<br>PO Box 29475<br>San Francisco CA 94129<br>United States |
| Telephone | +1 415-440-4433 |
| Fax | +1 415-563-4433 |
| Emergency Phone Number (both supplier and manufacturer) | Infotrac/ +1 800-535-5053<br>*May include subsidiaries or affiliate companies/divisions |
| Email | iusa@isoflex.com |
| Website | www.isoflex.com |
| Preparation Information | ISOFLEX USA<br>Product Safety<br>+1 415-440-4433 |

## 2. HAZARDS IDENTIFICATION

**Emergency Overview:**

| | |
|---|---|
| OSHA Hazards: | Target Organ Effect, Irritant |
| Target Organs: | Liver injury may occur; kidney injury may occur. |
| GHS Classification: | Skin irritation (Category 2), Eye irritation (Category 2A), Specific target organ toxicity - single exposure (Category 3) |

**NFPA Ratings:** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

**Health Hazard = 2** **Flammability = 0** **Reactivity = 0**

**HMIS Ratings:** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

**Health Hazard = 2** **Flammability = 0** **Physical Hazard = 0**

| | |
|---|---|
| HEALTH HAZARD | 2 |
| FLAMMABILITY | 0 |
| PHYSICAL HAZARD | 0 |

**Potential Health Effects**

| | |
|---|---|
| *Eye* | May cause eye irritation |
| *Skin* | May cause skin irritation |
| *Ingestion* | The toxicological properties of this substance have not been fully investigated. May be harmful if swallowed. |
| *Inhalation* | May cause respiratory tract irritation. The toxicological properties of this substance have not been fully investigated. |
| *Chronic* | Not available |

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

| | |
|---|---|
| Chemical Name: | Germanium |
| CAS No.: | 7440-56-4 |
| Chemical Formula: | Ge |
| Molecular Weight: | 72.64 g/mol |

## 4. FIRST AID MEASURES

| | |
|---|---|
| *Eye Exposure* | Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid. |
| *Dermal Exposure* | Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. |
| *Ingestion* | Get medical aid. Wash mouth out with water. |
| *Inhalation* | Remove from exposure to fresh air immediately. Get medical aid. |
| *Notes to Physician* | Treat symptomatically. |

## 5. FIREFIGHTING MEASURES

| | |
|---|---|
| *General Information* | As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH-approved or equivalent, and full protective gear. Will burn if involved in a fire. Flammable solid. |
| *Suitable Extinguishing Media* | Use extinguishing media most appropriate for the surrounding fire. |
| *Autoignition Temp* | Not available |
| *Flash Point* | Not available |
| *Explosion Limits* | |
| *Lower* | Not available |
| *Upper* | Not available |
| *Protective Equipment* | Wear self-contained breathing apparatus for firefighting if necessary. |
| *Hazardous Combustion* | Hazardous decomposition products formed under fire conditions: *Products* germanium oxides |

## 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| *Personal Precautions* | Use proper personal protective equipment as indicated in Section 8. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. |
| *Environmental Precautions* | Do not let product enter drains. |
| *Methods for Cleaning Up* | Vacuum or sweep up material and place into a suitable disposal container. Remove all sources of ignition. Use a spark-proof tool. |

## 7. HANDLING AND STORAGE

| | |
|---|---|
| *Handling* | Minimize dust generation and accumulation. Use spark-proof tools and explosion-proof equipment. Avoid breathing dust, vapor, mist or gas. Avoid contact with skin and eyes. Take precautionary measures against static discharges. |
| *Storage* | Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Store in “flammables area.” |

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|---|---|
| *Engineering Controls* | Use adequate ventilation to keep airborne concentrations low. |

**Personal Protective Equipment**

| | |
|---|---|
| *Eye* | Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. |
| *Hand* | Wear appropriate protective gloves to prevent skin exposure. |
| *Skin and Body* | Wear appropriate protective clothing to prevent skin exposure. |
| *Respirators* | Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH- or European Standard EN 149-approved respirator when necessary. |
| *Hygiene Measures* | Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. |

## 9. PHYSICAL AND CHEMICAL CHARACTERISTICS

**Appearance**

| | |
|---|---|
| Form | Ingots |
| Color | Black |
| Odor | Odorless |

**Safety Data**

| | | | |
|---|---|---|---|
| pH: | Not available | Freezing/Melting Point: | 937 °C |
| Vapor Pressure: | Not available | Decomposition Temperature: | Not available |
| Viscosity: | Not available | Solubility: | Insoluble |
| Boiling Point: | 2830 °C @ 760.00 mm Hg | Specific Gravity/Density: | 5.3500 g/cm$^3$ |
| Molecular Weight | 72.64 g/mol | | |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| *Chemical Stability* | Stable under normal temperatures and pressures |
| *Conditions to Avoid* | Incompatible materials |
| *Incompatible Materials* | Strong oxidizing agents, halogens, acids (mineral, non-oxidizing, e.g. hydrochloric acid, hydrofluoric acid, muriatic acid, phosphoric acid), acids (mineral, oxidizing, e.g. chromic acid, hypochlorous acid, nitric acid, sulfuric acid) |
| *Hazardous Decomposition Products* | Not available |
| *Hazardous Polymerization* | Will not occur |

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

| | |
|---|---|
| *Oral LD50* | No data available |
| *Inhalation LC50* | |
| *Dermal LD50* | No data available |
| *Other Information on Acute Toxicity* | No data available |
| *Skin Corrosion/Irritation* | No data available |
| *Serious Eye Damage/Eye Irritation* | No data available |
| *Respiratory or Skin Sensitization* | No data available |
| *Germ cell mutagenicity* | No data available |

### Carcinogenicity

| | |
|---|---|
| *IARC* | No component of this product present at levels greater than or equal to 0.1% is identified as a probable, possible or confirmed human carcinogen by IARC. |
| *ACGIH* | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. |
| *NTP* | No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. |
| *OSHA* | No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. |
| *Reproductive Toxicity* | No data available |
| *Teratogenicity* | No data available |
| *Specific Target Organ Toxicity/ Single Exposure (Globally Harmonized System)* | Inhalation - may cause respiratory irritation |
| *Specific Target Organ Toxicity / Repeated Exposure (Globally Harmonized System)* | No data available |
| *Aspiration Hazard* | No data available |

**Potential Health Effects**

| | |
|---|---|
| *Inhalation* | May be harmful if inhaled; causes respiratory tract irritation |
| *Ingestion* | May be harmful if swallowed |
| *Skin* | May be harmful if absorbed through skin; causes skin irritation |
| *Eyes* | Causes eye irritation |
| *Signs and Symptoms of Exposure* | Liver injury may occur; kidney injury may occur; blood disorders, cough, difficulty in breathing |
| *Synergistic Effects* | No data available |
| *Additional Information* | RTECS: LY5200000 |

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| *Toxicity* | No data available |
| *Persistence and Degradability* | No data available |
| *Bioaccumulative Potential* | No data available |
| *Mobility in Soil* | No data available |
| *PBT and vPvB Assessment* | No data available |
| *Other Adverse Effects* | No data available |

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| *Product* | Dispose of in a manner consistent with federal, state and local regulations. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. |
| *Contaminated Packaging* | Dispose of as unused product. |

## 14. TRANSPORT INFORMATION

| | |
|---|---|
| **DOT (US)** | Not dangerous goods |
| **IMDG** | Not dangerous goods |
| **IATA** | Not dangerous goods |

## 15. REGULATORY INFORMATION

| | |
|---|---|
| **OSHA Hazards** | Target Organ Effect, Irritant |
| **SARA 302 Components** | No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302. |
| **SARA 313 Components** | This material does not contain any chemical components with known CAS numbers that exceed the threshold (*De Minimis*) reporting levels established by SARA Title III, Section 313. |
| **SARA 311/312 Hazards** | Acute Health Hazard, Chronic Health Hazard |

| | |
|---|---|
| **Massachusetts Right to Know Components** | No components are subject to the Massachusetts Right to Know Act. |
| **Pennsylvania Right to Know Components** | Germanium / CAS No. 7440-56-4 |
| **New Jersey Right to Know Components** | Germanium / CAS No. 7440-56-4 |
| **California Prop. 65 Components** | This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm. |

## 16. OTHER INFORMATION

| | |
|---|---|
| Prepared By | ISOFLEX USA<br>PO Box 29475<br>San Francisco CA 94129<br>United States |
| Issuing Date | November 10, 2014 |
| Revision Date | August 1, 2021 |
| Revision Number | 2 |
| Revision Note | Required review and update |

**ISOFLEX USA's Commonly Used Abbreviations and Acronyms***

| | |
|---|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| ADR | European Agreement Concerning the International Carriage of Dangerous Goods by Road |
| ALARA | As Low As Is Reasonably Achievable |
| AMU | Atomic Mass Unit |
| ANSI | American National Standards Institute |
| BLS | Basic Life Support |
| CAM | Continuous Air Monitor |
| CAS | Chemical Abstracts Service (division of the American Chemical Society) |
| CEN | European Committee for Standardization |
| CERCLA | Comprehensive Environmental Response Compensation and Liability Act |
| CLP | Classification, Labelling and Packaging (European Union) |
| CPR | Controlled Products Regulations (Canada) |
| CWA | Clean Water Act (USA) |
| DAC | Derived Air Concentration (USA) |
| DOE | United States Department of Energy (USA) |
| DOT | United States Department of Transportation (USA) |
| DSL | Domestic Substances List (Canada) |
| EC50 | Half Maximal Effective Concentration |
| EINECS | European Inventory of Existing Commercial Chemical Substances |
| EHS | Environmentally Hazardous Substance |
| ELINCS | European List of Notified Chemical Substances |
| EMS | Emergency Response Procedures for Ships Carrying Dangerous Goods |
| EPA | Environmental Protection Agency (USA) |
| GHS | Globally Harmonized System |
| HMIS | Hazardous Materials Identification System (USA) |
| IARC | International Agency for Research on Cancer |
| IATA | International Air Transport Association |
| IBC | Intermediate Bulk Containers |

| | |
|---|---|
| ICAO | International Civil Aviation Organization |
| IDLH | Immediately Dangerous to Life or Health |
| IMDG | International Maritime Code for Dangerous Goods |
| LC50 | Lethal concentration, 50 percent |
| LD50 | Lethal dose, 50 percent |
| LOEC | Lowest-Observed-Effective Concentration |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MSHA | Mine Safety and Health Administration (USA) |
| NCRP | National Council on Radiation Protection & Measurements (USA) |
| NDSL | Non-Domestic Substances List (Canada) |
| NFPA | National Fire Protection Association (USA) |
| NIOSH | National Institute for Occupational Safety and Health (USA) |
| NOEC | No Observed Effect Concentration |
| N.O.S. | Not Otherwise Specified |
| NRC | Nuclear Regulatory Commission (USA) |
| NTP | National Toxicology Program (USA) |
| OSHA | Occupational Safety and Health Administration (USA) |
| PBT | Persistent Bioaccumulative and Toxic Chemical |
| PEL | Permissible Exposure Limit |
| PIH | Poisonous by Inhalation Hazard |
| RCRA | Resource Conservation and Recovery Act (USA) |
| RCT | Radiation Control Technician |
| REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals (Europe) |
| RID | Regulations Concerning the International Transport of Dangerous Goods by Rail |
| RTECS | Registry of Toxic Effects of Chemical Substances |
| SARA | Superfund Amendments and Reauthorization Act (USA) |
| TDG | Transportation of Dangerous Goods (Canada) |
| TIH | Toxic by Inhalation Hazard |
| TLV | Threshold Limit Value |
| TSCA | Toxic Substances Control Act |
| TWA | Time Weighted Average |
| UN | United Nations (Number) |
| VOC | Volatile Organic Compound |
| vPvB | Very Persistent Very Bioaccumulative Chemical |
| WGK | Wassergefährdungsklassen (Germany: Water Hazard Classes) |
| WHMIS | Workplace Hazardous Materials Information System |

*One or more of the above-listed items may not appear in this document.

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