Material Safety Data Sheet

SiO, Granule

1. Chemical Product
   PRODUCT NAME: Silicon monoxide
   FORMULA: SiO
   GENERAL USE: Evaporation material
   PRODUCT DESCRIPTION: SiO granule
   CHEMICAL FAMILY: Metal oxide

2. Composition, Information On Ingredients

<table>
<thead>
<tr>
<th>Component Name</th>
<th>CAS #</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon monoxide</td>
<td>10097-28-6</td>
<td>100%</td>
<td>233-232-8</td>
</tr>
</tbody>
</table>

3. Hazards Identification
   APPEARANCE: Black solid
   FLASH POINT: n/a
   TARGET ORGANS: May affect the respiratory system.
   POTENTIAL HEALTH EFFECTS: To the best of our knowledge the chemical, physical and toxicological properties of silicon monoxide have not been fully investigated.
   EYE: May cause abrasive irritation, characterized by redness, itching and watering.
   SKIN: May cause abrasive irritation, characterized by redness.
   INGESTION: No acute health effects recorded.
   INHALATION: May cause irritation to the respiratory system, characterized by coughing, shortness of breath, wheezing, change in breathing capacity and cyanosis.
   CHRONIC: Chronic inhalation may cause pneumoconiosis, pulmonary fibrosis and silicosis.

4. First Aid Measures
   EYES: Flush eyes with lukewarm water, lifting eyelids, for at least 15 minutes. Seek medical attention if symptoms persist.
   SKIN: Remove contaminated clothing. Brush material off skin and wash affected area with mild soap and water. Seek medical attention if symptoms persist.
   INGESTION: No acute or chronic health effects are known by ingestion.
   INHALATION: Remove victim to fresh air. Give oxygen if breathing is difficult. Seek medical attention if symptoms persist.
5. Fire Fighting Measures

GENERAL INFORMATION:

Silicon monoxide may emit toxic fumes if involved in a fire. May be flammable and possibly pyrophoric on contact with air at extremely elevated temperatures. Fire fighters 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.

EXTINGUISHING MEDIA:

Not applicable. Use suitable extinguishing media for surrounding materials and type of fire.

6. Accidental Release Measures

GENERAL INFORMATION:

Wear appropriate respiratory and protective equipment.

SPILLS/LEAKS:

Isolate spill area. Provide ventilation. Vacuum up spill using high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Do not raise dust. Dispose of in accordance with all federal, state and local regulations.

7. Handling And Storage

HANDLING AND STORAGE:

Store in a cool and dry place. Smoking and eating should be avoided in handling area.

8. Exposure Controls, Personal Protection

ENGINEERING CONTROLS:

Use local exhaust to maintain concentration at low exposure levels.

EXPOSURE LIMITS:

No exposure limits listed for ACGIH, NIOSH, OSHA.

OSHA:

<table>
<thead>
<tr>
<th>Component</th>
<th>PerCent</th>
<th>TLV</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon monoxide</td>
<td>100%</td>
<td>10 mg/m3</td>
<td>15 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(total dust)</td>
<td>(total dust)</td>
</tr>
</tbody>
</table>

PERSONAL PROTECTIVE EQUIPMENT

EYES: Safety glasses
SKIN: Impervious gloves
CLOTHING: Suitable to prevent skin contact
RESPIRATORS: NIOSH approved respirator.

9. Physical And Chemical Properties

PHYSICAL STATE: solid
APPEARANCE: black
ODOR: none
pH: n/a
VAPOR PRESSURE: n/a
VAPOR DENSITY: n/a
EVAPORATION RATE: n/a
VISCOITY: n/a
BOILING POINT: 1880°C (3416.0°F)
FREEZING/MELTING POINT: 1702.0°C (3095.6°F)
AUTOIGNITION TEMPERATURE: n/a
FLASH POINT: n/a
DECOMPOSITION TEMPERATURE: n/a
EXPLOSION LIMITS:
  LOWER: n/a
  UPPER: n/a
SOLUBIL IN WATER: insoluble
SPECIFIC GRAVITY/DENSITY: 2.13 (water=1)
MOLECULAR FORMULA: SiO
MOLECULAR WEIGHT: 44.08

n/a = not available

10. Stability And Reactivity

CHEMICAL STABILITY: Stable
CONDITIONS TO AVOID: None
INCOMPATIBILITY WITH OTHER MATERIALS: Strong acids and bases
HAZARDOUS DECOMPOSITION OF PRODUCTS: Silicon dioxide
HAZARDOUS POLYMERIZATION: Will not occur
11. Toxicological Information
   - ACUTE INHALATION EFFECTS: Not available.
   - EYE EFFECTS: Not available.
   - SKIN EFFECTS: Not available.
   - MUTAGENICITY: Not available.
   - ACUTE ORAL EFFECTS: Not available.

12. Ecological Information
   - ECOTOXICITY: Not available
   - PERSISTENCE AND DEGRADABILITY: Not available
   - BIOACCUMULATIVE POTENTIAL: Not available

13. Disposal Considerations
   - Comply with all federal, state and local regulations.
   - Do not dump this material into sewers, on the ground or into any body of water.

14. Transport Information
   - US DOT Hazard Class: Not hazardous from the standpoint of shipping.
   - IATA (for international shipments): Not hazardous from the standpoint of shipping.

15. Regulatory Information
   - Refer to any other federal, state and local regulations.

16. Other Information
   The information above is believed to be accurate and represents the best information currently available to us. We shall ensure, so far as is reasonably practicable, that any revision of this Data Sheet is sent to all customers to whom we have directly supplied this substance, but must point out that it is the responsibility of any intermediate supplier to ensure that such revision is passed to the ultimate user. The information given in the Data Sheet is designed only as guidance for safe handling, storage and the use of the substance. It is not a specification nor does it guarantee any specific properties. All chemicals should be handled only by competent personnel, with a controlled environment. We make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall TieWay International, Inc. be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if TieWay International, Inc. has been advised of the possibility of such damages.

References:
1. American Chemical Society, STN Easy Online Database
6. Industrial Hygiene and Toxicology, by F. A. Patty.
7. National Library of Medicine, Department of Health and Human Services, Hazardous Substances Data Bank (HSDB).
8. National Library of Medicine, Department of Health and Human Services, Hazardous Substances Data Bank (HSDB).
9. Niosh Registry of Toxic Effects of Chemical Substances (REECS) and Pocket Guide to Chemical Hazards.