MATERIAL SAFETY DATA SHEET
ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

1. Identification of the substance/mixture and of the company/undertaking

1.1. Product Details
Product Code: M2111C
Product Name: Tungsten diselenide powder
Full Name: Tungsten diselenide
REACH No.: A registration number is not available for this substance as the substance or its uses are exempted from registration or the annual tonnage does not require a registration.
CAS No.: 12067-46-8

1.2. Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Laboratory chemicals

1.3. Supplier details
Supplied by: Ossila Limited
Solpro Business Park
Windsor Street, Sheffield
S4 7WB, UK
Telephone: 0114 2999 180
Email address: info@ossila.com

2. Hazards identification

2.1. Classification of the substance or mixture
Hazard statements according to Regulation (EC) 1272/2008
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Specific target organ toxicity - repeated exposure (Category 2), H373
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

2.2. Label elements
Labelling according Regulation (EC) No 1272/2008 [CLP]

Signal word: Danger
Hazard statement(s)
H301 + H331: Toxic if swallowed or if inhaled
H373: May cause damage to organs through prolonged or repeated exposure.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P260: Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P301 + P330 + P331 + P310: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/ physician.
P304 + P340 + P311: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.

Supplemental information
None.
2.3. Other hazards

None.

3. Composition/Information on ingredients

3.1. Substances

Synonyms: Tungsten (IV) selenide, Tungsten selenide
Formula: WSe₂
Molecular weight: 253.86 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Weight %</th>
<th>CLP Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten diselenide</td>
<td>12067-46-8</td>
<td>&lt;=100</td>
<td>Acute Tox. 3 (H301 + H331); STOT RE 2 (H373); Aquatic Acute 1 (H400); Aquatic Chronic 1 (H410)</td>
</tr>
</tbody>
</table>

4. First aid measures

4.1. Description of first aid measures

After Inhalation
If inhaled, remove to fresh air. If not breathing give artificial respiration. Call a physician.

After skin contact
In case of skin contact, wash with soap and flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

After eye contact
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

After Ingestion
If swallowed, wash out mouth with water. Call a physician.

4.2. Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in section 11.

4.3. Indication of any immediate medical attention and special treatment needed

No data available.

5. Fire fighting

5.1. Extinguishing media

Suitable extinguishing media: Dry chemical, alcohol-resistant foam, carbon dioxide or water spray. Consult with local fire authorities before attempting large scale fire-fighting operations.

5.2. Special hazards arising from the substance of mixture

Hazardous combustion products: Selenium/selenium oxides, tungsten oxides

5.3. Advice for firefighters

Wear a self-contained breathing apparatus if necessary. During a fire, irritating and highly toxic gases and vapours may be generated by thermal decomposition.
6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Wear personal protective equipment (section 8). Avoid dust formation. Ensure room is well ventilated.

6.2. Environmental precautions
Do not let product enter drains.

6.3. Containment and cleaning
Contain and clean up spill if safe to do so using an electrically protected vacuum cleaner or by wet-brushing. Dispose of dry waste in closed container for proper disposal according to local regulations.

7. Handling and storage

7.1. Precautions for safe handling
Avoid formation of dust and aerosols. Provide exhaust ventilation in places where dust is formed.

7.2. Conditions for safe storage, including any incompatibilities
Store in a cool, dry and well-ventilated place inside of a tightly sealed container. Reseal containers that have been opened and keep upright to prevent leakage. Store locked up.
Quality-related information: Air and moisture sensitive. Store under inert gas.

7.3. Specific end uses
Use in laboratories.

8. Exposure controls / Personal protection

8.1. Control parameters
Exposure limit sources
UK – EH40 Workplace Exposure Limits (WEL).

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tungsten diselenide</td>
<td>12067-46-8</td>
<td>0.1 mg/m³ (TWA)</td>
</tr>
</tbody>
</table>

TWA - time weighted average; STEL - Short Term Exposure Limit

Biological occupational exposure limits
This product does not contain any hazardous materials with biological limits.

8.2. Exposure controls
Engineering measures
Handle in accordance with good industrial engineering/laboratory practices for hygiene and safety. Ensure eyewash stations and safety showers are close to the laboratory workstation. Ensure good general ventilation is present when handling the product.

Personal protective equipment
Eyes: Wear safety glasses with side-shields conforming to appropriate government standards such as NOISH (US) or EN166 (EU).
Skin: Handle with appropriate gloves and use proper glove removal technique to avoid skin contact. Dispose of gloves in accordance with applicable laws. Wash and dry hands.
The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
Clothing: Wear complete suit protecting against chemicals; the type of equipment should be appropriate for the concentration and amount of dangerous substance used.
Respirators: Use multi-purpose combination particle respirator N99 (US) or type ABEK P2 (EN 14387) respirator cartridges as a backup to engineering controls. Respirators should be approved under appropriate government standards such as NIOSH (US) or CEN (EU).

General hygiene measures
Wash thoroughly after handling. Wash contaminated clothing before reuse.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid metallic powder</td>
</tr>
<tr>
<td>Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting/freezing point</td>
<td>&gt;1,200°C</td>
</tr>
<tr>
<td>Boiling point/range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
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</tr>
<tr>
<td>Vapour density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other safety information
No data available.

10. Stability and reactivity

10.1 Reactivity
No data available.

10.2. Chemical stability
Stable under normal temperatures and pressures under recommended storage conditions.

10.3. Possibility of hazardous reactions
No data available.

10.4. Conditions to avoid
No data available.

10.5. Incompatible materials
Strong oxidising agents.

10.6. Hazardous decomposition products
No known hazardous decomposition products.
11. Toxicological information

11.1. Information on toxicological effects

Acute toxicity
Toxic if swallowed or if inhaled.
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
No data available.
Reproductive toxicity
No data available.
Specific target organ toxicity - single exposure
No data available.
Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard
No data available.
Routes of exposure
Eye contact, ingestion, inhalation, skin contact.
Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. Ecological information

12.1. Toxicity
No data available.

12.2. Persistence and degradability
No data available.

12.3. Bioaccumulative potential
No data available.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6. Other adverse effects
No data available.

13. Disposal

13.1. Waste treatment methods
Product
Burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state and local environmental regulations and directives on waste and hazardous waste. Offer surplus material to a licensed professional waste disposal professional.

**Contaminated packaging**
Dispose of as unused product.

### 14. Transport

#### 14.1. UN number

ADR/RID: 3283  
IMDG: 3283  
IATA: 3283

#### 14.2. UN proper shipping name

ADR/RID: Selenium compound, solid, n.o.s. (Tungsten diselenide)  
IMDG: Selenium compound, solid, n.o.s. (Tungsten diselenide)  
IATA: Selenium compound, solid, n.o.s. (Tungsten diselenide)

#### 14.3. Transport hazard class

ADR/RID: 6.1  
IMDG: 6.1  
IATA: 6.1

#### 14.4. Packaging group

ADR/RID: III  
IMDG: III  
IATA: III

#### 14.5. Environmental hazards

ADR/RID: yes  
IMDG: yes  
IATA: no

#### 14.6. Special precautions for user

No special precautions required.

### 15. Regulatory information

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006, the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

#### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

No data available.

#### 15.2 Chemical safety assessment

No chemical safety report/assessment was carried out for this product.

### 16. Other information

**Warranty**

This material is for research and development use only. The information provided here is based upon the available information from material suppliers but not warranted as complete and is provided only as a guide. Ossila Limited shall not be held responsible for any damage resulting from use or handling of this product.