

## Safety Data Sheet

### **I. Product Identification**

**Manufacturer/Supplier:**

QS Advanced Materials Inc

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Troy, MI 48085

Tel: 866-279-7170

E-mail: Sales@QSadvancedmaterials.com

**Product Name:** Bismuth Selenide (Bi<sub>2</sub>Se<sub>3</sub>) Sputtering Targets

**Formula of major composition:** Bi<sub>2</sub>Se<sub>3</sub>

**CAS Number:** 51184-14-6

### **II. Hazardous Identification**

**Classification of the substance or mixture**

Not a hazardous substance or mixture.

**GHS Label elements, including precautionary statements**

Not a hazardous substance or mixture.

**Hazards not otherwise classified (HNOC) or not covered by GHS - none**

### **III. Composition/information on ingredients**

**Specific Gravity:** No data.

**Solubility in H<sub>2</sub>O:** Insoluble

**Appearance and Odor:** Grey Solid, no odor

### **IV. FIRST AID MEASURES**

#### **4.1 Description of first aid measures**

**General advice**

Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration.

**In case of skin contact**

Wash off with soap and plenty of water.

**In case of eye contact**

Flush eyes with water as a precaution.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water.

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

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

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

No data available

**V. FIRE AND EXPLOSION HAZARDS DATA**

**Flash Point:** N/A

**Flammability:** N/A

**Autoignition Temperature:** N/A

**Flammable Limits:** **Upper:** NA  
**Lower:** NA

**Extinguishing Media:** Use suitable extinguishing media for surrounding material and type of fire.

**Special Firefighting Procedures:** 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.

**Unusual Fire & Explosion Hazards:** NA

**VI. Accidental release measures**

**6.1 Personal precautions, protective equipment and emergency procedures**

Avoid dust formation. Avoid breathing vapors, mist or gas. For personal protection see section VIII.

**6.2 Environmental precautions**

No special environmental precautions required.

**6.3 Methods and materials for containment and cleaning up**

Sweep up and shovel. Keep in suitable, closed containers for disposal.

#### **6.4 Reference to other sections**

For disposal see section XIII.

### **VII. Handling and storage**

#### **7.1 Precautions for safe handling**

Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

#### **7.2 Conditions for safe storage, including any incompatibilities**

Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.

Storage class (TRGS 510): 13: Non-Combustible Solids

#### **7.3 Specific end use(s)**

Apart from the uses as laboratory chemicals no other specific uses are stipulated

### **VIII. Exposure controls/personal protection**

**Respiratory Protection:**

NIOSH approved respirator.

**Ventilation:**

Use local exhaust to limit personal exposure to levels which do not exceed the TLV. General exhaust is recommended.

**Protective Gloves:**

Rubber gloves

**Eye Protection:**

Safety glasses

**Appropriate engineering controls:** General industrial hygiene practice.

### **IX. Physical and chemical properties**

- a) **Appearance** Grey Solid, no odor
- b) **Odor** odorless
- c) **Odor Threshold** No data available
- d) **pH** Solid, no data available
- e) **Melting point** N.A.
- f) **Initial boiling point** N.A.
- g) **Flash point** Not applicable
- h) **Evaporation rate** No data available
- i) **Flammability (solid, gas)** The product is not flammable.
- j) **Upper/lower flammability or explosive limits** No data available

- k) **Vapour pressure** No data available  
l) **Vapour density** No data available  
m) **Water solubility** Insoluble

## **X. Stability and reactivity**

### **10.1 Reactivity**

No data available

### **10.2 Chemical stability**

Stable 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 oxidizing agents

### **10.6 Hazardous decomposition products**

No decomposition in regular fire conditions.

## **XI. Toxicological information**

### **11.1 Information on toxicological effects Acute**

#### **toxicity**

LD50 Oral - Rat - male and female - > 10,000 mg/kg

(OECD Test Guideline 401)

LC50 Inhalation - Rat - male and female - 4 h - > 2.3 mg/l

(OECD Test Guideline 403)

Dermal: No data

available No data

available

#### **Skin corrosion/irritation**

Skin - Rabbit

Result: No skin irritation - 24

h (OECD Test Guideline 404)

#### **Serious eye damage/eye irritation**

Eyes - Rabbit

Result: No eye irritation

(OECD Test Guideline

405)

#### **Respiratory or skin sensitization**

Draize Test - Guinea pig

Result: Does not cause skin sensitization.

- Mouse

Result: Does not cause respiratory sensitization.

#### **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 probable, possible or confirmed human carcinogen by IARC.

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 on OSHA's list of regulated carcinogens.

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**Additional Information**

RTECS: Not available

Cough, chest pain, Difficulty in breathing, Gastrointestinal disturbance

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

**XII: Ecological information**

**12.1 Toxicity**

No data available

**12.2 Persistence and degradability**

The methods for determining the biological degradability are not applicable to inorganic substances.

**12.3 Bio accumulative 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

**XIII: Disposal considerations**

**13.1 Waste treatment methods Product**

Offer surplus and non-recyclable solutions to a licensed disposal company.

**Contaminated packaging**

Dispose of as unused product.

**XIV: Transport information**

**DOT (US)**

Not dangerous goods

**IMDG**

Not dangerous goods

**IATA**

Not dangerous goods

**XV: Regulatory information**

**SARA 302 Components**

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**

The following components are subject to reporting levels established by SARA Title III, Section 313:

Bismuth Selenide      CAS-No. 51184-14-6      Revision Date 1994-04-01

**SARA 311/312 Hazards**

Chronic Health Hazard

**XVI: Other information**

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. **QSAM** shall not be held liable for any damage resulting from handling or from contact with the above product

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