

**MATERIAL SAFETY DATA SHEET****I PRODUCT IDENTIFICATION**

**Trade Name:** Bismuth **Formula:** Bi  
**CAS:** 7440-69-9 **Chemical Family:** Metal

**II HAZARDOUS INGREDIENTS**

<b>Hazardous Components</b>	<b>%</b>	<b>OSHA/PEL</b>	<b>ACGIH/TLV</b>	<b>Sec. 302</b>	<b>Sec. 304</b>	<b>Sec. 313</b>
Bismuth	100	N/E	N/E	No	No	No

**HMIS Ratings:** Health: 3 **Flammability:** 3 **Reactivity:** 0 **Protective Equip:** H: glasses, gloves, clothing, combo resp.

**III PHYSICAL DATA**

<b>Boiling Point:</b>	1420 °C	<b>Melting Point:</b>	271.3 °C
<b>Specific Gravity</b>	9.80 g/cc	<b>Vapor Density:</b>	N/A
<b>Solubility in H<sub>2</sub>O:</b>	Insoluble	<b>Vapor Pressure:</b>	1 mm at 1020 °C
<b>% Volatile:</b>	N/E or N/A	<b>Evaporation Rate:</b>	N/A

**Appearance and Odor:** Gray, soft, bright metallic luster powder and pieces, no odor.

**IV FIRE AND EXPLOSION HAZARDS DATA**

**Flash Point:** N/E or N/A **Method Used:** Flammable  
**Explosive Limits:** Lower: N/E **Upper:** N/E

**Extinguishing Media:** Use class D or other suitable metal extinguishing agent.

**Special Firefighting Procedures:** Firefighters must wear full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

**Unusual Fire and Explosion Hazards:** Flammable when exposed to flame. May react with acid or acid fumes to emit toxic fumes. May react with [Bi(OH)<sub>3</sub> + Al(OH)<sub>3</sub>] coprecipitated, and hydrogen to produce a spontaneously flammable product. Superficially oxidized by air.

**V HEALTH HAZARD INFORMATION****Effects of Exposure:**

Bismuth and its salts can cause kidney damage, although the degree of such damage is usually mild. Large doses can be fatal. Industrially it is considered one of the less toxic of the heavy metals. Serious and sometimes fatal poisoning may occur from the injection of large doses into closed cavities and from extensive application to burns. It is stated that the administration of bismuth should be stopped when gingivitis appears, for otherwise serious ulceration stomatitis is likely to result. Other toxic results may develop, such as a vague feeling of bodily discomfort, presence of albumin or other protein substance in the urine, diarrhea, skin reactions and sometimes serious exodermatitis. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

**Acute Effects:**

**Inhalation:** POISON. May be a nuisance dust causing respiratory irritation. May cause foul breath, metallic taste and gingivitis.

**Ingestion:** POISON. May cause malaise, albuminuria, diarrhea, skin reactions, stomatitis, headache, fever, rheumatic pain and a black line may form on gums in the mouth.

**Skin:** May cause irritation

**Eye:** May cause irritation

#### **Chronic Effects:**

**Inhalation:** May affect the function of the liver and the kidneys.

**Ingestion:** May affect the function of the liver and kidneys. May cause anemia, black line may form on gums and ulcerative stomatitis.

**Skin:** May cause dermatitis.

**Eye:** No chronic health effects recorded.

**Target Organs:** May affect the kidneys and liver.

**Medical Conditions Generally Aggravated by Exposure:** Pre-existing skin and respiratory disorders.

**Routes of Entry:** Inhalation, Skin, and Ingestion

**Carcinogenicity:** None    **NTP?:** No    **IARC Monographs?:** No    **OSHA Regulated?:** No

#### **EMERGENCY AND FIRST AID PROCEDURES:**

**INHALATION:** Remove to fresh air. If breathing is difficult, give oxygen. Seek medical attention.

**INGESTION:** Administer 1-2 glasses of milk or water and induce vomiting. Seek medical attention. Never give anything by mouth or induce vomiting in an unconscious person.

**SKIN:** Brush material off skin and wash area with soap and water. Seek medical attention if symptoms persist.

**EYE:** Flush eyes with lukewarm water for at least 15 minute. Seek medical attention if symptoms persist.

#### **VI REACTIVITY DATA**

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**Stability:** Stable

**Conditions to avoid:** Heat, flame, incompatible materials.

**Incompatibilities:** Aluminum, BrF<sub>3</sub>, acids, NOF, NH<sub>4</sub>NO<sub>3</sub>, HClO<sub>3</sub>, Cl<sub>2</sub>, IF<sub>5</sub>, HNO<sub>3</sub>, HClO<sub>4</sub>, oxidants.

**Hazardous Decomposition Products:** Bismuth, oxides of bismuth and hydrogen.

**Hazardous Polymerization:** Will not occur

#### **VII SPILL OR LEAK PROCEDURES**

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**Steps to be Taken in Case Material is Released or Spilled:** Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill, insure proper ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a container for proper disposal. Take care not to raise dust. Use non-sparking tools.

**Waste Disposal Method:** Dispose of in accordance with applicable Federal, State and Local regulations.

#### **VIII SPECIAL PROTECTION INFORMATION**

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**Respiratory Protection (Specify Type):** Wear a NIOSH-approved dust-mist-fume cartridge respirator.

**Ventilation:** Use local exhaust to maintain concentration at low exposure levels. Handle powders in a controlled, enclosed environment. General exhaust is not recommended.

**Protective Gloves:** Rubber gloves

**Eye Protection:** Safety Glasses

**Other Protective Equipment:** Protective gear suitable to prevent contamination.

## **IX SPECIAL PRECAUTIONS**

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**Precautions to Be Taken in Handling and Storage:** Store in tightly closed containers in a cool, dry place. Store away from incompatible materials. Wash hands and face thoroughly after handling and before meals.

**Work Practices:** Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

**TSCA:** Listed in the EPA TSCA Inventory

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued by: S. Dierks  
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