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## SAFETY DATA SHEET

Section 1- IDENTIFICATION		
COMPOSITION <b>Bi</b>		PRODUCT NAME <b>Bismuth</b>
SUPPLIER: <b>Plasmaterials, Inc. 2268 Research Drive Livermore, CA 94550 Ph: 925-447-4030</b>	RECOMMENDED USE: <b>Laboratory Chemicals Scientific Research</b>	EMERGENCY TELEPHONE NUMBERS <b>US: 001-800-424-9300 Europe: 001-703-527-3887</b>

Section 2- HAZARD(S) IDENTIFICATION	
<b>Physical Hazards:</b> -Flammable Solid: Category 2 (H228)	<b>Health Hazards:</b> Not classified
<b>Environmental Hazard:</b> Not classified	<b>OSHA Defined Hazards:</b> Not classified
<b>LABEL ELEMENTS:</b> Signal Word: Danger	
	
<b><u>HAZARD STATEMENTS</u></b>	
<p>-The material as sold in solid form is generally not considered hazardous. However, if the process involves grinding, melting, cutting, or any other process that causes a release of dust or fumes, hazardous levels of airborne particulate could be generated.</p> <p>-H228: Flammable Solid</p> <p>-H370: Causes damage to organs</p> <p>-H372: Causes damage to organs (respiratory system) through prolonged or repeated exposure</p>	
<b><u>PRECAUTIONARY STATEMENTS</u></b>	
<p>-P210: Keep away from heat/sparks/open flames/hot surfaces – No Smoking</p> <p>-P240: Ground/bound container and receiving equipment</p> <p>-P241: Use explosion-proof electrical/ventilating/lighting equipment</p> <p>-P264: Wash face, hands, and any exposed skin thoroughly after handling</p> <p>-P270: Do not eat, drink, or smoke when using this product</p> <p>-P280: Wear protective gloves/protective clothing/eye protection/face protection</p> <p>-P308+P311: If exposed or concerned: Call a poison center or doctor</p> <p>-P321: Specific treatment (see this label)</p> <p>-P405: Store locked up</p> <p>-P501: Dispose of contents/container in accordance with local/regional/national/international regulations</p>	
<b>Hazards not otherwise classified (HNOC):</b>	
-None identified.	

### Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Molecular Weight
Bismuth	7440-69-9	208.98 g/mol

### Section 4- FIRST AID MEASURES

**GENERAL ADVICE:** Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

**INHALATION:** Remove victim from exposure to fresh air and keep at rest in a position comfortable for breathing. Give oxygen or artificial respiration if needed. Call a doctor/physician if symptoms develop and/or persist.

**SKIN CONTACT:** Immediately take off all contaminated clothing. Wash off with soap and plenty of water. Get medical attention if irritation develops and/or persists.

**EYE CONTACT:** Flush eyes with plenty of water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and/or persists.

**INGESTION:** Immediately call a poison control center or physician if ingestion of a large amount occurs. Rinse mouth. Get medical attention if symptoms occur.

**MOST IMPORTANT SYMPTOMS/EFFECTS:** Narcosis. Decrease in motor functions. Behavioral changes. May cause respiratory irritation. Edema. Proteinuria. Prolonged exposure may cause chronic effects.

**NOTES TO PHYSICIAN:** Provide general supportive measures and treat symptomatically.

### Section 5- FIREFIGHTING MEASURES

<b>Suitable Extinguishing Media:</b> Water Fog, Dry Chemical Powder, Carbon Dioxide (CO <sub>2</sub> ), Foam	<b>Unsuitable Extinguishing Media:</b> Do not use water jet as an extinguisher as this will spread the fire
<b>Specific Hazards Arising from the Chemical:</b> During fire, gases hazardous to health may be formed.	
<b>General Fire Hazards:</b> No unusual fire or explosion hazards noted	
<b>Protective Equipment &amp; Precautions for Firefighters:</b> As in any fire, Firefighters must wear full face, self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective clothing to prevent contact with skin and eyes.	
<b>Specific Methods:</b> Use standard firefighting procedures and consider the hazards of other involved materials.	

### Section 6- ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection see section 8.

**Environmental Precautions:** Avoid discharge into drains, water courses, or onto the ground.

**Methods for Containment & Clean Up:** Stop the flow of material if this is without risk. Following product recovery flush area with water. Prevent entry into waterways, sewer, basements, or confined areas. For waste disposal see section 13 of SDS.

### Section 7- HANDLING AND STORAGE

**Handling:** Further processing of solid materials may result in the formation of combustible dusts. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Use care in handling/storage.

**Storage:** Store locked up. Store in original tightly closed container. Store in a cool, dry place out of direct sunlight. Store in a well-ventilated place. Keep away from heat, sources of ignition and incompatible materials.

## Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines:

**Occupational Exposure Limits:** No PEL, TLV or other recommended exposure limits noted for this substance.

**Biological Limit Values:** No biological exposure limits noted for the ingredient(s)

**Appropriate Engineering Controls:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Follow standard monitoring procedures.

**Hygiene Measures:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday. When using do not smoke, eat, or drink. Keep away from food and drink. Wash thoroughly after handling and before eating, drinking and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

### Personal Protective Equipment:

**Eye/Face Protection:** Wear safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU). Eye wash fountain is recommended but not normally needed.

**Skin and Body Protection:** Handle with chemical resistant gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Wear suitable protective clothing. Use of an impervious apron is recommended. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory Protection:** In case of insufficient ventilation, wear suitable respiratory equipment. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Thermal Hazards:** Wear appropriate thermal protective clothing when necessary.

## Section 9- PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Solid

**Odor:** No information available

**Odor Threshold:** No information available

**pH:** No information available

**Melting Point/Range:** 271°C (519.8°F)

**Boiling Point/Range:** 1564°C (2847.2°F)

**Flash Point:** No information available

**Evaporation Rate:** No information available

**Flammability (solid,gas):** Flammable solid

**Flammability or Exposure Limits:**

**Upper:** No data available

**Lower:** No data available

**Vapor Pressure:** No information available

**Vapor Density:** No information available

**Relative Density:** 9.78 g/cm<sup>3</sup> at 20°C

**Solubility:** No information available

**Partition coefficient; n-octanol/water:** No information available

**Auto Ignition Temperature:** No information available

**Decomposition Temperature:** No information available

**Viscosity:** No information available

**Specific Gravity:** 9.78 at 20°C

## Section 10- STABILITY AND REACTIVITY

**Reactive Hazard:** Stable and non-reactive under normal conditions of use, storage, and transport.

**Stability:** Stable under normal conditions

**Conditions to Avoid:** Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. Contact with incompatible materials.

**Incompatible Materials:** None known

**Hazardous Decomposition Products:** No information available

**Hazardous Reactions:** None known under conditions of normal processing

## Section 11- TOXICOLOGICAL INFORMATION

### Information on likely Routes of Exposure:

**Inhalation:** May cause irritation to the respiratory system

**Skin Contact:** No information available

**Eye Contact:** No information available

**Ingestion:** No information available

**Symptoms related to the physical, chemical, and toxicological characteristics:** Narcosis. Behavioral changes. Decrease in motor functions. Proteinuria. May cause respiratory irritation. Edema

### Information on Toxicological Effects:

**Acute Toxicity:** No information available

**Skin Corrosion/Irritation:** No information available

**Serious eye damage/irritation:** No information available

**Respiratory or Skin Sensitization:** No information available

**Carcinogenicity:** This product is not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA.

**Germ Cell Mutagenicity:** No information available

**Reproductive Toxicity:** No information available

**Development Effects:** No information available

**Specific Target Organ Toxicity – single exposure:** Causes damage to organs. May cause respiratory irritation.

**Specific Target Organ Toxicity – repeated exposure:** Causes damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure.

**Aspiration Hazard:** No information available

**Chronic Effects:** Causes damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful.

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

## Section 12- ECOLOGICAL INFORMATION

**Toxicity:** The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Persistence and Degradability:** No information available

**Bioaccumulation/Accumulation:** No information available

**Mobility in Soil:** No information available

**Other Adverse Effects:** No information available.

## Section 13- DISPOSAL CONSIDERATIONS

**Waste Disposal Methods:** Collect and reclaim or dispose in sealed containers to a licensed waste disposal site. Dispose of contaminated packaging as unused product. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways, or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

## Section 14- TRANSPORT INFORMATION

**DOT:** Not regulated as dangerous goods

**IATA:** Not regulated as dangerous goods

**IMDG/IMO:** Not regulated as dangerous goods

## Section 15- REGULATORY INFORMATION

**US Federal Regulations:** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the US EPA TSCA Inventory List. CERCLA/SARA Hazardous Substance List-Not applicable.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt.D):** Not regulated

**U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053):** Not Listed

**CERCLA Hazardous Substance List (40 CFR 302.4):** Not Listed

**SARA 302 Extremely Hazardous Substance:** No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

**SARA 304 Emergency Release Notification:** Not regulated

**SARA 311/312 Hazardous Chemical:** No

**SARA 313 (TRI Reporting):** 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

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List:** Not regulated

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):** Not regulated

**Safe Drinking Water Act (SDWA):** Not regulated

**US California Proposition 65:** This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

## Section 16- OTHER INFORMATION

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulations are subject to change, the conditions of handling and use, or misuse are beyond our control, Plasmaterials, Inc. makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

The information in this SDS was obtained from sources, which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

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