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## SAFETY DATA SHEET

Section 1- IDENTIFICATION		
COMPOSITION <b>Ag</b>		PRODUCT NAME <b>Silver</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>Classification:</b> This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)	
<b>Physical Hazards:</b> Not Classified	<b>Health Hazards:</b> Not Classified
<b>Acute Aquatic Toxicity:</b> Category 1 (H400)	<b>Chronic Aquatic Toxicity:</b> Category 1 (H410)
<b>OSHA Defined Hazards:</b> Not Classified	
<b>LABEL ELEMENTS: Signal Word: Danger</b>	
	
<b>HAZARD STATEMENTS</b>	
<ul style="list-style-type: none"> <li>-H317: May cause an allergic skin reaction</li> <li>-H320: Causes eye irritation</li> <li>-H370: Causes damage to organs.</li> <li>-H372: Causes damage to organs (respiratory system) through prolonged or repeated exposure</li> <li>-H400: Very toxic to aquatic life</li> <li>-H410: Very toxic to aquatic life with long lasting effects.</li> </ul>	
<b>PRECAUTIONARY STATEMENTS</b>	
<ul style="list-style-type: none"> <li>-P264: Wash face, hands and any exposed skin thoroughly after handling</li> <li>-P270: Do not eat, drink or smoke when using this product</li> <li>-P273: Avoid release to the environment.</li> <li>-P280: Wear protective gloves, protective clothing, eye protection and face protection</li> <li>-P321: Specific treatment (See this label)</li> <li>-P333 + P313: If skin irritation or rash occurs: Get medical advice/attention</li> <li>-P337 + P313: If eye irritation persists: Get medical advice/attention</li> <li>-P363: Wash contaminated clothing before reuse</li> <li>-P391: Collect spillage.</li> <li>-P405: Store locked up</li> <li>-P501: Dispose of contents/container to an approved waste disposal plant</li> </ul>	
<b>Hazards not otherwise classified (HNOC):</b>	
-None identified.	

### Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Molecular Weight
Silver	7440-22-4	107.86 g/mol

### Section 4- FIRST AID MEASURES

**GENERAL ADVICE:** If exposed or concerned, get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Move out of dangerous area. Wash contaminated clothing before reuse.

**INHALATION:** Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. If symptoms develop or persist, consult a physician.

**SKIN CONTACT:** Wash off with soap and plenty of water. If skin irritation or rash occurs: consult a physician. For minor skin contact, avoid spreading material on unaffected skin.

**EYE CONTACT:** Flush eyes with lukewarm water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses if present and easy to do. Continue rinsing. If eye irritation persists, consult a physician.

**INGESTION:** Rinse mouth with water. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.

**MOST IMPORTANT SYMPTOMS/EFFECTS:** May cause allergic skin reaction. Conjunctivitis. Corneal damage. Irritation of eyes and mucous membranes. Prolonged exposure may cause chronic effects.

**INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED:** Provide general supportive measures and treat symptomatically. Symptoms may be delayed.

### Section 5- FIREFIGHTING MEASURES

**Suitable Extinguishing Media:**

Carbon Dioxide (CO<sub>2</sub>); Dry Chemical, Water Fog, alcohol-resistant foam

**Unsuitable Extinguishing Media:**

No Information Available

**Specific Hazards Arising from the Chemical:**

During fire, gases hazardous to health may be formed.

**Protective Equipment & Precautions for Firefighters:**

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.

**Firefighting Instructions/Specific Methods:**

Use water spray to cool unopened containers. Water runoff can cause environmental damage. Use standard firefighting procedures and consider the hazards of other involved materials.

**General Fire Hazards:**

No unusual fire or explosion hazards noted.

### Section 6- ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Keep unnecessary personnel away. 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:** Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into water courses, drains and onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. See Section 12 for additional ecological information.

**Methods for Containment & Clean Up:** Immiscible with water and will spread on the water surface. Stop the flow of material, if this is without risk. Collect spillage. Do not let this chemical enter the environment, waterways, sewer, basements or confined areas. Following product recovery, flush area with water. For disposal see Section 13.

## Section 7- HANDLING AND STORAGE

**Handling:** Do not handle until all safety precautions have been read and understood. Avoid contact with eyes and skin. Avoid prolonged exposure. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Do not empty into drains. Provide adequate ventilation. Observe good industrial hygiene practices.

**Storage:**

Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store away from incompatible materials (see Section 10).

## Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure Guidelines:**

Component	CAS-No.	Value	Control Parameters	Basis
Silver	7440-22-4	PEL	0.01 mg/m <sup>3</sup>	USA Occupational exposure limits (OSHA)- Table Z-1 Limits for air contaminants
		TWA	0.010000 mg/m <sup>3</sup>	USA Occupational exposure limits (OSHA)- Table Z-1 Limits for air contaminants
		TWA	0.1 mg/m <sup>3</sup> (Dust & Fume)	USA.ACGIH Threshold Limit Values (TLV)
		Remarks	Argyria	
		TWA	0.01 mg/m <sup>3</sup> (Dust)	USA.NIOSH Pocket Guide to Chemical Hazards Recommended Exposure Limits
		PEL	0.01 mg/m <sup>3</sup>	California Permissible Exposure Limits for Chemical Contaminants(Title 8,Article 107)

**Engineering Measures:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday. 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).

**Skin and Body Protection:** Handle with 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 appropriate chemical resistant clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory Protection:** Wear positive pressure self-contained breathing apparatus (SCBA). 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.

**Control of Environmental Exposure:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

## Section 9- PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Solid

**Appearance:** Not available

**Odor:** No data available

**Odor Threshold:** No data available

**pH:** No data available

**Melting Point/Range:** 960.5°C / 1760.9°F

**Boiling Point/Range:** 2000°C / 3632°F

**Flash Point:** No data available

**Evaporation Rate:** No data available

**Flammability (solid, gas):** No information available  
**Flammability or Exposure Limits:**  
**Upper:** No data available  
**Lower:** No data available  
**Vapor Pressure:** No data available  
**Vapor Density:** No data available  
**Relative Density:** 10.49 g/mL  
**Solubility:** Insoluble  
**Partition coefficient; n-octanol/water:** No data available  
**Auto Ignition Temperature:** No data available  
**Decomposition Temperature:** No data available  
**Viscosity:** No data available  
**Explosive Properties:** No data available  
**Oxidizing Properties:** No data available  
**Specific Gravity:** 10.49 at 15°C

### Section 10- STABILITY AND REACTIVITY

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

**Stability:** Stable under recommended storage conditions.

**Conditions to Avoid:** Contact with incompatible materials

**Incompatible Materials:** Ammonia, Chlorine

**Hazardous Decomposition Products:** No data available

**Hazardous Polymerization:** No data available

**Hazardous Reactions:** No data available

### Section 11- TOXICOLOGICAL INFORMATION

#### Information on Toxicological Effects:

Component	CAS-No.	LD50 Oral	LD50 Dermal
Silver	7440-22-4	Rat = >5000 mg/kg	Rat = >2000 mg/kg

**Acute toxicity:** May cause allergic skin reaction.

**Inhalation:** Prolonged inhalation may be harmful.

**Skin Contact:** May cause an allergic skin reaction

**Eye Contact:** Causes eye irritation

**Ingestion:** Due to the lack of data, the classification is not possible

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:**

Conjunctivitis, Corneal Damage

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

**Serious eye damage/irritation:** Causes eye irritation

**Respiratory Sensitization:** No information available

**Skin Sensitization:** May cause an allergic skin reaction

**Carcinogenicity:** This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP or EPA classification.

-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.

-NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen.

-OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen.

**Germ Cell Mutagenicity:** No information available  
**Reproductive Effects:** No information available  
**STOT – single exposure:** Causes damage to organs  
**STOT – repeated exposure:** Causes damage to organs through prolonged or repeated exposure.  
**Aspiration Hazard:** No information available  
**Chronic Effects:** Causes damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful.  
**Additional Information:**  
 -RTECS: VW3500000  
 -May cause argyria (a slate-gray or bluish discoloration of the skin and deep tissues due to the deposit of insoluble albuminate of silver)

**Section 12- ECOLOGICAL INFORMATION**

**Toxicity:** Very toxic to aquatic life with long lasting effects. Accumulation in aquatic organisms is expected  
**Toxicity to Fish:**  
 -Crustacea – EC50 – Water flea (Daphnia magna) – 0.0002 mg/l – 48.0 h  
 -Fish – LC50 – Fathead Minnow (Pimephales Promelas) – 0.0023-0.0033 mg/l – 96.0 h  
**Persistence and Degradability:** No information available  
**Bioaccumulation:** No information available  
**Mobility in Soil:** No information available  
**Results of PBT and vPvB assessment:** PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.  
**Other Adverse Effects:** Very toxic to aquatic life. An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**Section 13- DISPOSAL CONSIDERATIONS**

**Waste Disposal Methods:** Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. 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:**  
**UN-No:** 3077  
**Proper Shipping Name:** Environmentally hazardous substance, Solid, N.O.S.  
**Hazard Class:** 9  
**Packing Group:** III  
**Reportable Quantity (RQ):** 1 lbs  
**Poison Inhalation Hazard:** No

**IATA:**  
**UN-No:** 3077  
**Proper Shipping Name:** Environmentally hazardous substance, Solid, N.O.S.  
**Hazard Class:** 9  
**Packing Group:** III

**IMDG/IMO:**  
**UN-No:** 3077  
**Proper Shipping Name:** Environmentally hazardous substance, Solid, N.O.S.  
**Hazard Class:** 9  
**Packing Group:** III  
**EMS-No:** F-A, S-F  
**Marine Pollutant:** Yes

**Further Information:**  
 EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods >5L for liquids or >5Kg for solids.

## Section 15- REGULATORY INFORMATION

### US Federal Regulations:

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

**U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):** Not Listed

**CERCLA Hazardous Substance List (40 CFR 302.4):** Silver (CAS No: 7440-22-4) – Listed

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

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

Component	CAS No.	% By Weight	Revision Date
Silver	7440-22-4	100	1993-04-24

**SARA 311/312 Hazards:** Yes

**SARA Hazard Categories:**

**Immediate Hazard:** No

**Delayed Hazard:** No

**Fire Hazard:** No

**Pressure Hazard:** No

**Reactive Hazard:** No

**HMIS (USA):**

**Health Hazard:** 0

**Chronic Health Hazard:** \*

**Flammability:** 0

**Physical Hazard:** 0

**National Fire Protection Association (USA):**

**Health Hazard:** 0

**Fire Hazard:** 0

**Reactivity Hazard:** 0

**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

**Clean Water Act (CWA) Section 112 (r) (40 CFR 68.130):** Priority pollutant – Toxic pollutant

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

**US Massachusetts RTK – Substance List:**

Component	CAS No.	Revision Date
Silver	7440-22-4	1993-04-24

**US New Jersey Worker and Community Right to Know Act:**

Component	CAS No.	Revision Date
Silver	7440-22-4	1993-04-24

**US New Jersey RTK – Substances: Listed substance:**

Component	CAS No.	Revision Date
Silver	7440-22-4	1993-04-24

**US Pennsylvania RTK Hazardous Substances – Special Hazard – (All compounds of this substance are considered environmental hazards):**

Component	CAS No.	Revision Date
Silver	7440-22-4	1993-04-24

**US Pennsylvania Worker and Community Right to Know Law:**

Component	CAS No.	Revision Date
Silver	7440-22-4	1993-04-24

**US Rhode Island RTK:**

Component	CAS No.	Revision Date
Silver	7440-22-4	1993-04-24

**US California Proposition 65:** This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

**US California Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3 subd. (a)):** Silver (CAS-No: 7440-22-4)

**US California Controlled Substances, CA Department of Justice (California Health and Safety Code: Section 11100):** Not listed

## **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.

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