
MATERIAL SAFETY DATA SHEET

Silver Nano Colloid

Section I - Chemical Products & Company Identification

Bioneer Corporation

49-3, Munpyeong-Dong, Daedeok-Gu,

Daejeon 306-220, Korea

Phone: +82-42-930-8591

Creation Date: 03/09

Trade Name/Synonyms: Silver Nano Colloid

Chemical Family: Silver and Water

Section 2 - Composition/Information On Ingredients

Active Component: Silver

Description: (CAS Number)

Silver (CAS Number: 7440-22-4); 1.0 wt%

Water (CAS Number: 7732-18-5); 99.0 wt%

Section 3 - Hazards Identification

Hazard Description: Chronic exposure affects skin, eyes and respiratory tract.

May cause irritation to skin and eyes

NFPA Ratings (Scale 0-4):

Health = 1

Flammability = 0

Reactivity = 0

Potential Health Effects:

Skin Contact: May cause irritation with redness and pain

Eye Contact: May cause irritation, redness and pain

Ingestion: See chronic effects

Inhalation: See chronic effects

Chronic Exposure:

Prolonged or repeated inhalation, application or ingestion of silver and its compounds may cause a permanent bluish discoloration of the skin, eyes, and mucous membranes. This condition is called argyria. This effect can be either

local or generalized. It appears that localized deposition occurs by penetration of fine, metallic particles and that generalized argyria occurs from inhalation or ingestion of silver salts. It is estimated that a gradual intake of 1 to 5g silver will lead to generalized argyria. Argyria of the eyes is not accompanied by vision loss although there may be some difficulty adapting to the dark.

There is some evidence for skin absorption. Repeated skin contact may also cause allergic contact dermatitis. Silver deposits in the respiratory tract may also cause a mild chronic bronchitis.

Section 4: First Aid Measures

Skin Contact: Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

Ingestion: Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.

Inhalation: Remove to fresh air. Get medical attention for any breathing difficulty.

Section 5: Fire Fighting Measures

Fire: In water dried form, this material may ignite when exposed to flame or by reaction with incompatible materials.

Explosion: Not considered to be an explosion hazard.

Suitable Extinguishing Agents: Use any means suitable for extinguishing surrounding fire. If material is burning, use dry powder.

Protective Equipment: Use protective clothing and breathing equipment appropriate for the surrounding fire.

Section 6: Accidental Release Measures

Person-related safety precautions: Wear appropriate personal protective equipment as specified in Section 8. Ensure adequate ventilation. Keep away from ignition sources.

Measures for environmental protection: Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting: Ensure adequate ventilation. Keep away from ignition sources.

Section 7 - Handling and Storage

Handling

Information for safe handling: Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace. Protect against physical damage.

Storage

Requirements to be met by storerooms and receptacles: Store in a cool location.

Further information about storage conditions: Keep container tightly sealed. Store in cool, dry conditions in well sealed containers.

Section 8 - Exposure Controls/Personal Protection

Exposure Controls: Use in laboratory hood or other ventilated device. Use prudent laboratory practices for handling chemical substances of unknown toxicity.

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

0.01 mg/m³ for silver metal dust and fume as Ag

-ACGIH Threshold Limit Value (TLV):

0.1 mg/m³ for silver metal

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face high efficiency particulate respirator (NIOSH type N100 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency particulate respirator (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use

concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear protective gloves and clean body-covering clothing.

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9 - Physical and Chemical Properties

Description: Odorless, Orange Solution in water

Melting point: 960°C for Silver and 0°C for water

Boiling point: 2212°C for Silver and 100°C for water

Density: approximately 1.0 g/cm³

Vapor pressure: Not determined

Vapor density: Not determined

Flash point: Not applicable

Flammability: Not flammable

Decomposition temperature: Not determined

Explosion limits: Not determined

Solubility in water: soluble

Section 10 - Stability and Reactivity

Stability: Stable under normal temperatures and pressure.

Hazardous Decomposition Products: May emit metallic fumes at high temperatures.

Hazardous Polymerization: Will not occur.

Incompatibilities: Acetylene (forms explosive silver acetylides), ammonia (becomes flammable), sulfuric acid, peroxides, carboxylic acids, chlorine trifluoride, oxalic and tartaric acids.

Section 11 - Toxicology Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a tumorigen.

NTP Carcinogen of Silver

Known: No

Anticipated: No

IARC Category: None

Section 12 - Ecological Information

Environmental Fate:

This material is not expected to significantly bioaccumulate.

Environmental Toxicity:

No information found.

Section 13 - Disposal Information

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14 - Transportation Information

Not regulated.

Section 15 - Regulatory Information

_____ Chemical Inventory Status - Part 1 _____

Ingredient	TSCA	EC	Japan	Australia
Silver (7440-22-4)	Yes	Yes	No	Yes

_____ Chemical Inventory Status - Part 2 _____

Ingredient	--Canada--			
	Korea	DSL	NDSL	Phil.
Silver (7440-22-4)	Yes	Yes	No	Yes

_____Federal, State & International Regulations - Part 1_____

Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Silver (7440-22-4)	No	No	Yes	No

_____Federal, State & International Regulations - Part 2_____

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8(d)
Silver (7440-22-4)	1000	No	No

Chemical Weapons Convention: No **TSCA 12(b):** No **CDTA:** No
SARA 311/312: **Acute:** Yes **Chronic:** Yes **Fire:** No **Pressure:** No
Reactivity: No

Section 16 – Other Information

Label Hazard Warning: WARNING! CHRONIC EXPOSURE AFFECTS SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE IRRITATION TO SKIN AND EYES.

Label Precautions:

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid breathing dust. Use with adequate ventilation. Keep container closed.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Get medical attention if irritation develops.

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