

Section 1. Product and Company Identification

Product Identity: FUZE F1 (Ag & Au) in distilled water – (shipping concentration 30 ppm solution)

Manufacturer:

FUZE Biotech, LLC
1895 W 2100 S
Salt Lake City, UT 84119 Suite #100
Emergency Telephone: 801-809-6000

MSDS prepared by:

FUZE Biotech, LLC

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Section 2. Hazards Identification

Emergency Overview: No known OSHA hazards. Not a dangerous substance according to GHS.

Potential Health Effects: Pure metal silver is relatively non-toxic to humans. This product may cause mild local irritation to eyes, nose, throat and upper airways. Silver is not listed as a carcinogen by OSHA, NTP, IARC, ACGIH or the EU (see Toxicological Information, Section 11).

Potential Environmental Effects: In the form in which this product is sold, it has low bioavailability and does not pose any significant environmental risks. Good handling and storage protocols will limit environmental exposure. (See Ecological Information, Section 12)

Hazardous Materials Identification System (HMIS):

FUZE Ag Silver Nanospheres	
HEALTH	0
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	0

FUZE Au Gold Nanospheres	
HEALTH	0
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	0

Section 3. Composition/Information on Ingredients

Ingredient	Approximate Percent by Weight	CAS Number	Occupational Exposure Limits (OELs)	LD ₅₀ / LC ₅₀
Silver	0.003%	7440-22-4	OSHA PEL: 0.01 mg/m ³ NIOSH REL: 0.01 mg/m ³ ACGIH TLV: 0.1 mg/m ³	>5000 mg/kg (oral, rat) >2000 mg/kg (dermal, rat)
Gold	0.00001-0.0001%	7440-57-5	OSHA PEL: N/A NIOSH REL: N/A ACGIH TLV: N/A	N/A

NOTE: OELs for individual jurisdictions may differ from OSHA PELs. Check with local authorities for the applicable OELs in your jurisdiction. OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH – National Institute for Occupational Safety and Health. OEL – Occupational Exposure Limit, PEL – Permissible Exposure Limit, TLV – Threshold Limit Value, REL – Recommended Exposure Limit.

Section 4. First Aid Measures

Eye Contact: No effects expected. If irritation does occur, flush with lukewarm water 5-15 minutes. If irritation persists, immediately obtain medical attention.

Skin Contact: No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Inhalation: If symptoms are experienced move victim from exposure area to fresh air immediately and obtain medical advice.

Ingestion: If swallowed, no specific intervention is indicated as this material is not likely to be hazardous by ingestion. However, if irritation or discomfort occurs, obtain medical advice.

Section 5. Fire Fighting Measures

Fire and Explosion Hazards: Not Applicable

Extinguishing Media: Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical, or foam.

Fire Fighting: Fire fighters should be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

Section 6. Accidental Release Measures

Procedures for Cleanup: Control source of spillage if possible to do so safely. Clean up spilled material immediately, observing precautions in Section 8, Personal Protection. Treat or dispose of waste material in accordance with all local, regional, and national requirements.

Personal Precautions: Protective clothing and gloves are recommended for persons responding to an accidental release. Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact with dust or spray.

Environmental Precautions: Silver metal is not considered to pose immediate ecological risks; however, good management practices should always be applied in the storage and use of silver and its compounds. Accidental release of the product to water and soil should be prevented. Use adsorbent material to isolate any spills.

Section 7. Handling And Storage

Store silver in a secure, covered area away from incompatible materials. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate, designated areas. No special packaging materials are required. Store at ambient conditions. Do not refrigerate or freeze. Keep at temperatures 20-50 °C.

Section 8. Exposure Controls / Personal Protection

Protective Clothing: Gloves and coveralls or other work clothing are recommended to reduce direct skin contact. Appropriate eye protection should be worn where aerosols are generated.

Ventilation: Use adequate local or general ventilation when not working in open air environment.

Respirators: Where silver aerosols are generated, and above recommended levels, use appropriate NIOSH-approved respiratory protection equipment (a 42CFR84 Class N, R or P-95 particulate filter cartridge or better).

Section 9. Physical And Chemical Properties

Appearance:	Yellow liquid
Odor:	None
Physical State:	Liquid
pH:	6.8-7.2
Vapor Pressure:	Negligible @ 20°C
Vapor Density:	Not Applicable
Boiling Point/ Range:	100°C
Melting Point/ Range:	N/A
Specific Gravity:	1.00
Evaporation Rate:	Not Applicable
Coefficient Water/Oil Distribution:	Not Applicable
Odor Threshold:	None
Water Solubility:	Insoluble

Section 10. Stability And Reactivity

Stability & Reactivity: N/A

Incompatibilities: Strong oxidizing agents.

Hazardous Decomposition Products: Hazardous decomposition products may be formed under fire conditions. In the event of fire, see section 5.

Section 11. Toxicological Information

General: Solid silver has limited toxicity. Acute toxicity is low; toxicity occurs following chronic exposure. Significant long-term exposure to silver dust can cause staining of tissues.

Solid Gold presents few health hazards. Repeated long-term exposure to gold dust can cause staining of the skin

Acute:

Skin/Eyes: Direct contact may cause mild local skin or eye irritation. There have been limited reports of allergic contact dermatitis following exposure to powdered silver solutions, and dental amalgams.

Inhalation: Inhalation of silver aerosol may be irritating to mucous membranes and the upper respiratory tract.

Ingestion: Ingestion of silver compounds may cause irritation of the stomach. However, ingestion is not a typical route of occupational exposure.

Chronic:

Excessive exposure to silver dust causes pigmentation to the skin, eyes and mucous membranes. Staining occurs slowly and may take years to develop. Once present, staining does not go away and, in the most severe cases, may be disfiguring. Staining is not considered to be a toxic effect. Silver is not listed as a human carcinogen by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the American Conference of Governmental Industrial Hygienists (ACGIH) or the European Union (EU).

Section 12. Ecological Information

Silver metal is relatively insoluble, and therefore poses minimal ecological risks. However, its processing, use or extended exposure in aquatic and terrestrial environments may result in conversion of the metal to more bioavailable forms. In particular, silver compounds can be highly toxic to aquatic organisms.

Section 13. Disposal Considerations

Dispose in accordance with applicable regulations.

Section 14. Transport Information

No special shipping or transportation requirements.

Section 15. Regulatory Information

U.S.:

Listed on TSCA Inventory	Yes
Hazardous Under Hazard Communication Standard	Yes (due to OSHA PEL for Silver)
CERCLA Section 103 Hazardous Substance	Yes RQ 1,000lbs. (454 kg.)*
* Reporting not required if the diameter of the metal pieces released is equal to or exceeds 100 micrometers (0.004 inches)	
EPCRA Section 302 Extremely Hazardous Substance	No
EPCRA Section 311/312 Hazard Categories	No Hazard Categories Apply
EPCRA Section 313 Toxic Release Inventory:	Silver - CAS Number 7440-22-4 Percent by Weight 0.002%

CANADIAN:

Listed on Domestic Substances List	Yes
WHMIS Classification	Not applicable. Silver is not a controlled product under WHMIS. This Safety Data Sheet is provided for information purposes only.

EUROPEAN UNION:

Listed on the European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
EU GHS CLP Classification	Silver metal is not classified.

Section 16. Other Information

The information in this material safety data sheet is based on the following references:

- American Conference of Governmental Industrial Hygienists, 2004, Documentation of the Threshold Limit Values and Biological Indices, 7th Edition plus updates
- American Conference of Governmental Industrial Hygienists, 2004, Guide to Occupational Exposure Values – 2012
- American Conference of Governmental Industrial Hygienists, 2012, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices
- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition (P. G. Urban Ed.) 1995
- Canadian Centre for Occupational Health And Safety (CCOHS) CHEMINFO Chemical Substance Database
- Commission de la santé et la sécurité du travail, Service du Répertoire toxicologique – Argent Métal
- European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC
- Industry Canada, SOR/88–66, Controlled Products Regulations, as amended
- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, 13th Edition
- National Library of Medicine, National Toxicology Information Program, Hazardous Substance Data Bank (on-line version)
- Patty's Toxicology, 5th Edition, 2001: E. Bingham, B. Cohnsen & C.H. Powell, Ed.
- U.S. Dept. of Health and Human Services, National Institute for Occupational Safety And Health, NIOSH Pocket Guide to Chemical Hazards (on-line version)
- US Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910

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Notice to Reader

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration, and investigation. FUZE extends no warranty and assumes no responsibility for the accuracy of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling and processing of this product; it does not and cannot advise on all possible situations. Therefore, your specific use of this product should be evaluated to determine if additional precautions are required. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.