

Silver Pre-Dispersion in Water

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: The following products are covered by this MSDS:
S2-30W
S2-80W
S3-500W

MANUFACTURER: *NanoDynamics Inc.*
901 Fuhrmann Blvd.
Buffalo, NY, U.S.A., 14203
Phone: 716-853-4900 (8 AM to 5 PM EST,
Monday to Friday)

FOR MORE INFORMATION CALL: 716-853-4900
**IN CASE OF EMERGENCY CALL: For Chemical Emergency Spill Leak Fire Exposure or
Accident Call CHEMTREC Day or Night (1-800- 424-9300)**

INGREDIENT	CAS NUMBER	WEIGHT %
Silver	7440-22-4	See Section #16
Water	7732-18-5	See Section # 16

This material is classified as hazardous under OSHA regulations (29CFR 1910.1200).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Dark gray / black paste, no odor.
Caution! May be harmful if inhaled or swallowed. May cause respiratory tract irritation.
Prolonged or repeated inhalation, ingestion or skin contact may cause a permanent discoloration of skin, eyes and mucous membranes, a condition called 'argyria'. May cause skin and eye irritation. May cause adverse kidney effects.

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POTENTIAL HEALTH HAZARDS

TARGET ORGANS: Skin, eyes, respiratory system, digestive system, kidneys.

ACUTE HEALTH HAZARDS:

SKIN: May cause irritation. Symptoms may include redness and pain. This product may be absorbed.

EYES: May cause irritation.

INHALATION: May be harmful if inhaled. Inhalation may cause nose, throat and respiratory tract irritation. If dusts are formed, inhalation may result in mild bronchitis.

INGESTION: May be harmful if swallowed. May cause nausea, vomiting and pain.

CHRONIC AFFECTS: Chronic ingestion and inhalation may affect the kidneys. Prolonged or repeated inhalation, skin contact or ingestion may cause a permanent bluish discoloration of the skin, eye and mucous membranes, a condition called argyria.

PRE-EXISTING MEDICAL CONDITONS AGGRAVATED: May aggravate pre-existing skin, respiratory, digestive and kidney problems.

4. FIRST AID MEASURES

SKIN: Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water. Obtain medical attention if irritation persists. Launder clothing before reuse.

EYES: Immediately flush eyes with running water for a minimum of 15 minutes. Obtain medical attention if irritation persists.

INHALATION: Immediately remove person to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, begin artificial respiration. Obtain medical attention if irritation develops and persists.

INGESTION: If ingested, do not induce vomiting. Obtain medical attention. Never give anything by mouth to an unconscious or convulsing person.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: N/Av
AUTOIGNITION TEMPERATURE: N/Av
UPPER FLAME LIMIT (volume % in air): N/Av
LOWER FLAME LIMIT (volume % in air): N/Av
OSHA FLAMMABILITY CLASS: Non-Flammable

EXTINGUISHING MEDIA: Use media suitable to the surrounding fire, such as carbon dioxide and dry chemicals.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Do not enter fire area without proper protection. Fire fighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece. Move containers from fire area if it can be done without risk. Water spray may be useful in cooling equipment exposed to heat and flame.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

PERSONAL PRECAUTIONS: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate chemically protective equipment. Keep all other personnel upwind and away from the spill/release. Refer to Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION, for additional information on acceptable personal protective equipment.

ENVIRONMENTAL PRECAUTIONS: Ensure spilled product and flush solutions do not enter drains, sewers, waterways or confined spaces.

SPILL/RESPONSE CLEANUP: Eliminate all sources of ignition. Ventilate area of release. Stop leak if you can do so without risk. Contain and absorb with non-combustible, inert absorbent material and place in suitable container for later disposal (see Section 13). Flush area with water. Contaminated absorbent material may pose the same hazards as the spilled product. Notify the appropriate authorities as required.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

Safe handling procedures: This material may be a harmful liquid. Wear protective equipment during handling. Use in a well ventilated area. Avoid breathing fumes or vapors. Avoid contact with eyes, skin and clothing. Keep away from extreme heat and flame. Keep away from strong acids and other incompatibles. Avoid exposure to air. Keep container tightly closed when not in use. Assume empty containers contain residues, which are hazardous. Wash hands before eating, drinking, smoking or use of toilet facilities. Immediately remove soiled clothing and wash it thoroughly before reuse.

Storage requirements: Store in a cool, dry, well-ventilated area away from heat, flame and incompatible materials. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. No smoking in the area.

Special packaging materials: Always keep in containers made of the same materials as the supply container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Use adequate ventilation to maintain air contaminants below exposure limits. Local or exhaust ventilation recommended for prolonged exposures or if the TLV is not known.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION: Protective gloves impervious to the material should be worn during use. Advice should be sought from glove suppliers. Additional protective clothing, such as long sleeve shirts and/or coveralls, are recommended. An eyewash station and safety shower should be made available in the immediate working area.

EYE PROTECTION: Use chemical goggles. Contact lenses should not be worn.

RESPIRATORY PROTECTION: Respiratory protection is required if the airborne concentration exceeds the TLV. Use NIOSH-approved respirators. Advice should be sought from respiratory protection specialists.

General hygiene considerations: Avoid inhalation of fumes or vapors. Avoid contact with eyes, skin and clothing. Do not eat, drink or smoke when working. Upon completion of work, wash hands before eating, drinking, smoking or use of toilet facilities. Immediately remove soiled clothing and wash it thoroughly before reuse.

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>
Silver	0.1 mg/m ³ (metal)	0.01 mg/m ³ (metal and soluble compounds)

¹ = Limit established by General Chemical Corporation

² = Workplace Environmental Exposure Level (AIHA)

³ = Biological Exposure Index (ACGIH)

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Dark Gray / Black Paste
PHYSICAL STATE:	Paste
ODOR:	No Odor
SPECIFIC GRAVITY (water = 1.0):	10.5 (silver)
SOLUBILITY IN WATER (weight %):	Insoluble.
pH:	N/Av
BOILING POINT:	212°F (100° C)
VAPOR PRESSURE:	N/Av
VAPOR DENSITY (air = 1.0):	N/Av
EVAPORATION RATE:	N/Av
% VOLATILES:	N/Av

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

STABILITY AND REACTIVITY: Stable under the recommended storage and handling conditions prescribed.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid sources of heat and flame. Avoid contact with incompatibles.

MATERIALS TO AVOID (INCOMPATIBLES): Acetylene, ammonia, peroxides, strong acids, carboxylic acids, chlorine trifluoride, oxalic and tartaric acids.

HAZARDOUS DECOMPOSITION PRODUCTS: None known. Refer to Section 5 for 'Hazardous combustion products'.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA: There is no available data for the product itself, only for the ingredients. See below for individual ingredient acute toxicity data.

<u>Ingredients</u>	<u>LC₅₀(4hr)</u> <u>inh, rat</u>	<u>LD₅₀ (mg/kg)</u>	
		<u>oral, rat</u>	<u>dermal, rabbit</u>
Silver	N/Av	>5000	N/Av

CARCINOGENICITY: None of the ingredients listed are classified by IARC, ACGIH, NTP or OSHA as carcinogenic.

REPRODUCTIVE EFFECTS, TERATOGENICITY, MUTAGENICITY: None known.

SENSITIZATION TO MATERIAL: None known.

SYNERGISTIC MATERIALS: Not available.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: The ecological characteristics of this product have not been fully investigated. The product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters. Do not discharge product unmonitored into the environment.

CHEMICAL FATE INFORMATION: There is no data available on the product itself.

13. DISPOSAL CONSIDERATIONS

HANDLING FOR DISPOSAL: Handle according to recommendations listed in Section 7.

METHODS OF DISPOSAL: Dispose in accordance with all applicable federal, state and local regulations. Contact your local, state or federal environmental agency for specific rules.

RCRA: If this product, as supplied, becomes a waste, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to

determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US 49 CFR INFORMATION: As supplied, product is not regulated for shipments by ground within the continental United States.

IATA / ICAO INFORMATION: As supplied, product is not regulated for shipments by air, internationally.

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

US Information:

TSCA information: All ingredients are listed on the TSCA inventory.

EPA/CERCLA Reportable Quantity (RQ): Silver (RQ 1000 lbs.)

SARA TITLE III: Sec. 313, Toxic Chemicals Notification, 40 CFR 372: This material may be subject to the TSCA notification requirements, since it contains Silver, a Toxic Chemical constituent above its *de minimus* concentration.

California Proposition 65: To the best of our knowledge, this product does not contain any chemicals known to the State of California to cause cancer or reproductive harm.

New Jersey Labeling Requirements: This product contains the following substances required to be disclosed on product labeling:

<u>Chemical Name</u>	<u>CAS #</u>	<u>New Jersey Hazardous Substance</u>
Water	7732-18-5	No
Silver	7440-22-4	Yes

International Information:

Canadian CEPA information: All ingredients listed are present on the DSL.

Canadian WHMIS Classification: This product is not a WHMIS Controlled Product. It does not meet any of the criteria for a controlled product provided in Part IV of the Controlled Products Regulations (CPR).

16. OTHER INFORMATION

NAME	INGREDIENT	WEIGHT %	INGREDIENT	WEIGHT %	CAS NUMBER
S2-30W	Water	50 - 65	Silver	35 - 50	7440-22-4
S2-80W	Water	25 - 45	Silver	55 - 75	7440-22-4
S2-500W	Water	25 - 45	Silver	55 - 75	7440-22-4

HMI-ES Rating:

0 - Insignificant 1 - Slight 2 - Moderate 3 - High 4 - Extreme

* - Chronic Hazard

Health: *1 Flammability: 1 Reactivity: 0

- Legend:** **ACGIH:** American Conference of Governmental Industrial Hygienists
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
NIOSH: National Institute of Occupational Safety and Health
WHMIS: Workplace Hazardous Materials Information System
CAS: Chemical Abstract Services
CFR: Code of Federal Regulations
DOT: Department of Transportation
DSL: Domestic Substances List
EPA: Environmental Protection Agency
EST: Eastern Standard Time
IARC: International Agency for Research on Cancer
HSDB: Hazardous Substances Data Bank
IATA: International Air Transport Association
N/Ap: not applicable
ICAO: International Civil Aviation Organization
N/Av: not available
OSHA: Occupational Safety and Health Administration
NTP: National Toxicology Program
RCRA: Resource Conservation and Recovery Act
PEL: Permissible Exposure Limit
SARA: Superfund Amendments & Reauthorization Act
TLV: Threshold Limit Values
TSCA: Toxic Substance Control Act

References:

1. ACGIH, Threshold Limit Values and Biological Exposure Indices for 2006.
2. International Agency for Research on Cancer Monographs, 2006.
3. Canadian Centre for Occupational Health and Safety, CCIInfoWeb databases, 2006 (Chempendium, HSDB and RTECs).
4. US EPA Title III List of Lists – January 27, 2005 version.
5. California Proposition 65 List – February 3, 2006 version.

CURRENT ISSUE DATE: 10/5/06

PREVIOUS ISSUE DATE: 8/25/06

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING: N/Ap

OTHER INFORMATION: N/Ap