

SDS SHEET

Rev 12-13-17

Mn:ZnSe Nanocrystals in Water

1. PRODUCT IDENTIFICATION

Chemical Name: Zinc/Manganese Selenide in Water (Doped Nanocrystals/D-dots)

Supplier: NN Crystal US Corporation 534 W Research Center Blvd., Ste 254 Fayetteville, AR 72701

Product Line: DDW

Phone: 479.95.0662

Recommended Use: Research and development use only.

2. HAZARDS IDENTIFICATION

GHS Classification:

Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 3), H331

Specific target organ toxicity - repeated exposure (Category 2), H373

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

GHS Label Elements:



Signal Word

Danger

Hazardous Statements

H301 + H331

Toxic if swallowed or if inhaled

H373

May cause damage to organs through prolonged or repeated exposure.

H410

Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P260

Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.

P264

Wash skin thoroughly after handling.

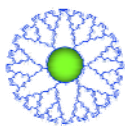
P270

Do not eat, drink or smoke when using this product.

NNCrystal US Corporation

534 W Research Center Blvd., Ste 254, Fayetteville, AR 72701

Phone: 479.595.0662; Fax: 479.595.0570; E-mail: contact@nn-labs.com



NNCrystal US Corporation

P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.
P304 + P340 + P311	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician.
P314	Get medical advice/ attention if you feel unwell.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENT (EACH VIAL)

Chemical Name: Zinc/Manganese Selenide (Doped Nanocrystals/D-dots)

Chemical Formula: Mn/ZnSe

Mixture Composition:

Substance Name	CAS #
ZnSe	1315-09-9
MnSe	1313-22-0
Water	7732-18-15
3-mercaptopropionic acid	107-96-0

4. FIRST AID MEASURES

Eye:

1. Flush immediately with warm water for at least 20 minutes.
2. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
3. If pain persists or recurs seek medical attention.
4. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

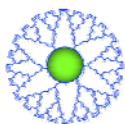
Skin:

1. Removing contaminated clothing, shoes and leathery wearings.
2. Washing affected area thoroughly with soap and water for at least 20 minutes.
3. Call a physician if irritation develops or persists.

Ingestion:

1. If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomits.
2. If victim is conscious and alert, give 2-4 cupfuls of milk/water to dilute the substance in the stomach.
3. Never give anything by mouth to an unconscious person.
4. Don't induce vomiting unless directed to by a medical person.
5. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible, prior to initiating first aid procedures.
6. Seek medical attention.

Inhalation:



NNCrystal US Corporation

-
1. Remove from further exposure and flush thoroughly with air.
 2. Lay patient down. Keep warm and rested.
 3. Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
 4. If respiratory irritation seek immediate medical assistance and call a physician.

5. FIRE FIGHTING MEASURES

Suitable extinguishing agents: Foam, CO₂, dry chemical, water fog

Protective equipment: Wear self-contained respirator if necessary. Wear protective gloves.

6. ACCIDENTAL RELEASE MEASURES

Person-related safety precautions: Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation

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

Measures for cleaning/collecting:

1. Clean up all spills immediately.
2. Avoid breathing vapors and contact with skin and eyes.
3. Control personal contact by using protective equipment.
4. Contain and absorb small quantities with vermiculite or other absorbent material.
5. Wipe up.

7. HANDLING AND STORAGE

Precautions for safe handling:

1. Keep container tightly sealed. Store in refrigerator (2-8°C) under dark conditions.
2. Wash thoroughly after handling

Conditions for safe storage, including any incompatibilities:

1. Keep container tightly sealed. Store in refrigerator (2-8°C) under dark conditions.
2. Do not store with acids or oxidizers.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Additional information about design of technical systems: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

General protective and hygienic measures: The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages, and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.

Protection of hands: Impervious gloves, check gloves using UV light after use to determine level of contamination.

Eye protection: Safety glasses

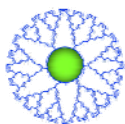
Body protection: Protective work clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES:

Form: Liquid form. Crystalline powder, dissolved in a solvent

Color: Clear when dilute, Yellowish Clear when concentrated, White/Yellow in powder form.

Odor: aromatic petroleum odor crystalline powder is odorless



NNCrystal US Corporation

Melting point/Melting range: ~1100°C to bulk melting point of Mn:ZnSe crystals.

Boiling point/Boiling range: Determined by solvent used;

Sublimation temperature / start: Not determined

Flash point: not determined

Ignition temperature: 480°C

Decomposition temperature: Not determined

Danger of explosion: Dependent upon solvent used. Crystalline powder does not present an explosion hazard.

Vapor pressure: 17.5mmHg@20°C/68F

Density: 5.42 g/cm³ (crystal at 20 °C) for the nanocrystal powder if isolated

Solubility in / Miscibility with Polar Solvents: Soluble when hydrophilic ligands are present

Solubility in / Miscibility with Non-Polar Solvents: Soluble when hydrophobic ligands are present

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperature and pressure

Stability: Stable at room temperature in closed containers under normal storage and handling conditions

Incompatible materials: strong oxidizers, nitric and sulfuric acids

Hazardous decomposition products: Carbon monoxide, carbon dioxide, hydrocarbons

Thermal decomposition / conditions to be avoided: Not determined, but temperature increases will affect the solvent used. Be aware of the necessary warnings for the specific solvent used.

Dangerous reactions: No dangerous reactions known for nanocrystals but look up specifics for the solvent

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: Selenium may cause amyotrophic lateral sclerosis, bronchial irritation, gastrointestinal distress, nasopharyngeal irritation, garlic odor on breath and sweat, metallic taste, pallor, irritability, excessive fatigue, loss of fingernails and hair, pulmonary edema, anemia and weight loss.

Zinc and Manganese fumes may cause metal fume fever. Effects include dry throat, metallic taste, chest pain, dyspnea, rales and dry cough. Several hours later, chills many occur with lassitude, malaise, fatigue, headache, back pain, muscle cramps, blurred vision, nausea, fever, perspiration, vomiting and leukocytosis.

Skin: Irritant to skin and mucous membranes.

Eye: Irritating effect.

Sensitization: No sensitizing effects known.

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA, or ACGIH.

WARNING: Many of the toxic effects of Mn:ZnSe nanocrystals are still being researched and are currently unknown at this point. Use at own risk.

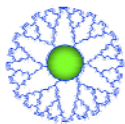
12. ECOLOGICAL INFORMATION:

Do not allow material to be released into the environment without proper governmental permits.

13. DISPOSAL CONSIDERATIONS

Consult local or national regulations for proper disposal.

14. TRANSPORT INFORMATION



NNCrystal US Corporation

DOT Classification:

Not a DOT controlled material (United States).

Identification:

Not applicable.

Special Provisions for Transport:

Not applicable

15. REGULATIONS

SARA 302 Components

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

SARA 313 Components

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.

SARA 311/312 Hazards

16. Other Information

HMIS Rating

Health hazard: 2

Chronic Health Hazard: *

Flammability: 0

Physical Hazard: 0

NFPA Rating

Health hazard: 2

Fire Hazard: 0

Reactivity Hazard: 0