

SDS SHEET

Rev 12-13-17

Indium Phosphide Zinc Sulfide Nanocrystals in Water

1. PRODUCT IDENTIFICATION

Chemical Name: Indium Phosphide Zinc Sulfide Nanocrystals in Water
Supplier: NNCrystal US Corporation 534 W Research Center Blvd., Ste 254 Fayetteville, AR 72701
Product Line: INPW
Phone: 479.595.0662
Recommended Use: Research and development use only.

2. HAZARDS IDENTIFICATION

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - repeated exposure (Category 1), H372
Chronic aquatic toxicity (Category 3), H412

GHS Label Elements:



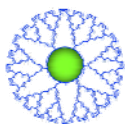
Signal Word: Danger

Hazardous Statements

H225	Highly flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H350	May cause cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure
H401	Toxic to aquatic life

Precautionary Statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.



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P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS --none

3. COMPOSITION/INFORMATION ON INGREDIENT

Chemical Name: Indium Phosphide Zinc Sulfide Nanocrystals

Chemical Formula: INP/ZnS

<u>Substance Name</u>	<u>CAS #</u>
InP	22398-80-7
ZnS	1314-98-3
Water	7732-18-5
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

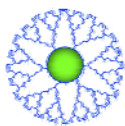
Ingestion:

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

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



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Suitable extinguishing agents: Foam, CO₂, dry chemical

Product is not flammable.

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. Remove all ignition sources
2. Clean up all spills immediately
3. Avoid breathing vapors and contact with skin and eyes
4. Control personal contact by using protective equipment
5. Contain and absorb small quantities with vermiculite or other absorbent material
6. Wipe up
7. Collect residues in a flammable waste container

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

Exposure Limits Indium Phosphide:

TWA: 0.100000 mg/m³

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.

Breathing equipment: Use suitable respirator when high concentrations are present.

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

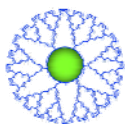
Color: Clear/Yellow – Brown

Odor: Odor dependent upon solvent used. Crystalline powder is odorless

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Melting point/Melting range: ~1070 to bulk melting point of InP crystals. The solvent is liquid and melting point depends on the chemical composition of the solvent.

Boiling point/Boiling range: Determined by solvent used

Sublimation temperature / start: Not determined

Flash point: Dependent upon solvent used

Ignition temperature: Dependent upon solvent used

Decomposition temperature: Not determined

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

Explosion limits: Currently unknown for nanocrystals

Vapor pressure: Dependent upon solvent used

Density: 4.79 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 under normal conditions and pressures

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

Incompatible materials: Heat, flame, strong oxidizers, nitric and sulfuric acids, chlorine, nitrogen tetroxide; will attack some forms of plastics, rubber, and coatings

Hazardous decomposition products: Carbon monoxide, carbon dioxide, hydrocarbons

Thermal decomposition / conditions to be avoided: Not determined, but temperature increases will affect the solvent used.

11. TOXICOLOGICAL INFORMATION

Skin: Irritant to skin and mucous membranes.

Eye: Irritating effect.

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity: Inorganic phosphorus compounds may cause irritation and hemorrhages in the stomach as well as liver and kidney damage. Bone structure may be attacked, especially the jaw and teeth.

Exposure to indium compounds may cause pain in the joints and bones, tooth decay, nervous and gastrointestinal disorders, heart pain and general debility. Experiments with animals also indicate that indium may cause reduced food and water consumption with weight loss, pulmonary edema, pneumonia, blood, liver and kidney damage, leg paralysis and damage to the brain, heart, adrenals, and spleen.

If phosphine is generated, central nervous system, cardiac and respiratory injury may occur.

Carcinogenicity

IARC: 2A - Group 2A: Probably carcinogenic to humans (Indium phosphide)

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

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

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12. ECOLOGICAL INFORMATION

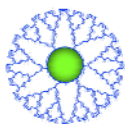
Do not allow material to be released to the environment without proper governmental permits.

13. DISPOSAL CONSIDERATIONS

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Consult local or national regulations for proper disposal.

14. TRANSPORT INFORMATION

DOT (US): Not dangerous goods

IMDG: Not dangerous goods

IATA: Not dangerous goods

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

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

Zinc sulfide	CAS-No 1314-98-3	Revision Date 2007-07-01
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Massachusetts Right to Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right to Know Components

Zinc sulfide	CAS-No 1314-98-3	Revision Date 2007-07-01
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New Jersey Right to Know Components

Indium phosphide	CAS-No 22398-80-7	Revision Date 2009-07-17
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Zinc sulfide	CAS-No 1314-98-3	Revision Date 2007-07-01
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California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause cancer.

Indium phosphide	CAS-No. 22398-80-7	Revision Date 2007-09-28
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This product does not contain any chemicals known to the state of California to cause birth defects, or any other reproductive harm.

OTHER INFORMATION

HMIS Rating

Health hazard: 0

Chronic Health Hazard: *

Flammability: 0

Physical Hazard: 0

NFPA Rating

Health hazard: 0

Fire Hazard: 0

Reactivity Hazard: 0

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