

Material Safety Data Sheet

Company: Crystalplex (412) 246-2044
Address: 2403 Sidney St. Suite 280, Pittsburgh, PA 15203

Section 1 - Chemical Product

Product Family #: CdSe

Substance: CdSe crystals in toluene

Synonyms: Nanocrystals, quantum dots

Chemical Family Solvent: Toluene
Crystal: II-VI semiconductor compound

Section 2 - Composition, Information on Ingredients

Component:	CAS#	% by Weight
Cadmium Selenide nanocrystal compound	1306-24-7	<1
Toluene	108-88-3	>99

Section 3 - Hazards Identification

Hazard Description: Xn Harmful

Color: Red-brown

Physical Form: Nanocrystals suspended in Toluene

Odor: Aromatic Odor

Major Health Hazards: Carcinogen. Harmful if inhaled, ingested, or contacted with skin

Physical Hazards: Flammable liquid and vapor

Potential Health Effects:

Inhalation: Irritation, respiratory toxicity, mucous membrane irritation, headache, nausea, vomiting

Skin Contact: Irritation, dermatitis

Eye Contact: Irritation

Ingestion: Vomiting, nausea, organ damage

Carcinogen Status (cadmium containing substances)

OSHA: No

NTP: No

IARC: No

Section 4 - First Aid Measures

Inhalation: If inhaled, remove to fresh air. If not breathing give artificial respiration and seek medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical attention if needed.

Eye Contact: Irrigate eyes for at least 15 minutes. Seek medical attention.

Ingestion: If ingested, seek medical attention immediately. If person is unconscious, turn head to side to prevent aspiration of vomit.

Section 5 - Firefighting Measures

Flash Point: 39 °F 4 °C Method: closed cup

Autoignition Temp: 480 °C

Flammability: 1.1% LEL – 7.1% UEL

Extinguishing Media: Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

Firefighting: Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of vapors.

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 - Engineering Controls & Personal Protective Equipment

OSHA Permissible Exposure Limits (PEL)

Cadmium containing compounds:	0.005 mg/m ³ 8hr TWA
Toluene:	200 ppm 8 hr TWA 300 ppm Ceiling

ACGIH Threshold Limit Value (TLV)

Cadmium containing compounds:	0.002 mg/m ³ 8hr TWA
Toluene:	50 ppm 8 hr TWA

Eye Protection:	Wear chemical/splash resistant safety goggles. Emergency eye wash fountain and quick drench shower should be provided in the immediate work area.
Ventilation:	Provide local ventilation or work in fume hood. All ventilation equipment should be explosion resistant if explosive concentrations of material are present.
Respirator:	Wear respirator when high concentrations are present.
Clothing:	Wear appropriate chemical resistant clothing.
Gloves:	Wear appropriate chemical resistant gloves for type of exposure.

Section 9 - Physical & Chemical Properties

Cd/Se Crystals

No data available

Toluene

Appearance Color: Colorless
Form: Clear liquid
Property – Value - At Temperature or Pressure
Molecular Weight 92.14 AMU
pH: N/A
BP/BP Range 111 °C
Freezing Point -95 °C
Vapor Pressure 22 mmHg @ 20 °C
Vapor Density 3.14 g/l
SG/Density 0.8669 g/cm³

Section 10 - Reactivity

Stability:	Stable at standard temperatures and pressure.
Conditions to avoid:	Can aggregate and precipitate with hot sonication. Avoid heat, flame, and oxidizers.
Hazardous Decomposition:	Carbon monoxide, Carbon dioxide, toxic biproducts

Section 11 - Toxicological Information

Cadmium Selenide Nanocrystals

Acute toxicity:

Primary irritant effects

on the skin: Irritant to skin and mucous membranes.

on the eyes: Irritating effect.

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity: Cadmium and cadmium compounds are highly toxic and experimental carcinogens. Exposure affects the respiratory tract, kidneys, and liver. Ingestion may cause nausea, salivation, vomiting and diarrhea. Ingestion or inhalation of cadmium/cadmium compounds may be fatal. Selenium may cause bronchial irritation, gastrointestinal distress, vasopharyngeal irritation, garlic odor on breath and sweat, metallic taste, pallor, irritability, excessive fatigue, loss of fingernails and hair, pulmonary edema, anemia and weight loss.

Additional toxicological information: Danger through skin absorption. To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. EPA-B1: Probable human carcinogen, limited evidence of carcinogenicity from epidemiologic studies. IARC-1: Carcinogenic to humans: sufficient evidence of carcinogenicity. NTP-2: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals. Carcinogen as defined by OSHA. ACGIH A2: Suspected human carcinogen: Agent is carcinogenic in experimental animals at dose levels, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. Available epidemiologic studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans.

Toluene

Acute
toxicity:

Primary irritant effects

on the skin: Irritant to skin and mucous membranes.

on the eyes: Irritating effect.

Inhalation: May cause irritation to the upper respiratory tract, coughing, difficulty breathing, nausea, headache, and vomiting

Ingestion: May be harmful if swallowed.

Section 12 - Ecological Information

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

Section 13 - Transportation Information

U.S. DOT 49 CFR 172.101		
Proper Shipping Name:	Cadmium Selenide	Toluene
DOT hazard:	Toxic 6.1	Flammable Liquid 3
UA/NA ID	2570	1294
Packing Group:	III	II
Exceptions:	49 CFR 172.150	49 CFR 172.150

Section 14 - Disposal

Dispose in accordance with all applicable regulations.

Section 15 - Other Regulatory Information

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

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