

# PbS Core EviDots in PMMA

MSDS

## Section 1 - Chemical Product

Product Family #:	PbS Core EviDots in PMMA
Substance:	Core EviDots in PMMA
Trade Names/Synonyms:	Core EviDots
Chemical Family:	Matrix: aromatic hydrocarbon Nanocrystal: IV-VI semiconductor compound

## Section 2 - Composition, Information on Ingredients

Component	CAS#	EC#	% By Weight
Toluene	108-88-3	203-625-9	85-95
Lead Sulfide (as nanocrystal compound)	1314-87-0	215-246-6	1-3
Polymethyl methacrylate (PMMA)	9011-14-7	none	5-15

## Section 3 - Hazards Identification

Hazard Description:	Toxic, Dangerous to the Environment
NFPA Rating:	Health = 2 Fire = 3 Reactivity = 0

Emergency Overview	
Color:	Brown-Black
Physical Form:	Liquid
Odor:	Distinct odor
Major Health Hazards:	Respiratory tract irritation, skin irritation, eye irritation, aspiration hazard, central nervous system depression, nerve damage.

### Emergency Overview

Physical Hazards:	Flammable
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### Potential Health Effects

Inhalation:	Irritation, nausea, headache, drowsiness, dizziness, disorientation, sleep disturbances, loss of coordination, dilated pupils, kidney damage and liver damage	
Skin Contact:	Irritation	
Eye Contact:	Irritation	
Ingestion:	Nausea, stomach pain, headache, drowsiness, dizziness, disorientation, sleep disturbances, loss of coordination, dilated pupils, kidney damage, liver damage, aspiration hazard.	
Carcinogen Status:	Toluene	Lead
OSHA:	No	No
NTP:	No	No
IARC:	No	Yes

## 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 personal protective equipment, clothing and shoes. Seek medical attention if needed.
Eye Contact:	Irrigate eyes for at least 15 minutes. Seek medical attention.
Ingestion:	If ingested, do not induce vomiting, seek medical attention immediately.

## Section 5 - Fire Fighting Measures

Extinguishing Media:	Dry chemical, carbon dioxide and foam extinguisher
Fire Fighting:	Avoid Inhalation of material or combustion by-products
Flash Point:	39° F (4° C) (closed cup)
Flammable Limits:	1.2% LEL -7.1% UEL
Autoignition Point:	896° F (480° C)
Flammability Class:	OSHA Class IB

## Section 6 - Accidental Release Measures

Small Spills:	Absorb with spill pillow or other non-combustible material. Collect spilled material in appropriate container for disposal
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## Section 7 - Handling and Storage

Store in a tightly closed container. Store in a cool dry place.

## Section 8 - Engineering Controls & Personal Protective Equipment

Exposure Limits	
Toluene	200ppm OSHA TWA PEL 300ppm ceiling OSHA 50ppm ACGIH TWA (skin) 100ppm (375 mg/m <sup>3</sup> ) NIOSH TWA 10hour 190mg/m <sup>3</sup> DFG MAK 50ppm (191 mg/m <sup>3</sup> ) UK OES TWA
Lead containing compounds:	0.05 mg/m <sup>3</sup> TWA PEL 0.03 mg/m <sup>3</sup> OSHA action level 8 hours 0.05 mg/m <sup>3</sup> ACGIH TWA 0.1 mg/m <sup>3</sup> NIOSH TWA (10 hours) 0.1 mg/m <sup>3</sup> DFG MAK
PMMA	No exposure limits established

Ventilation:	Provide local exhaust ventilation system or work in a chemical fume hood. Considerations should be made for the use of non-sparking or intrinsically safe ventilation systems and equipment if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.
Eye Protection:	Wear safety glasses with side shields as a minimum level of protection. If splash or splatter is possible, wear chemical/splash resistant safety goggles and or face shield. Emergency eye wash station and quick drench shower should be provided in the immediate work area as per the ANSI Z358.1 guidelines.
Clothing:	Wear appropriate chemical resistant clothing.
Gloves:	Wear appropriate chemical resistant gloves for type of exposure. (Butyl or nitrile glove are resistant to incidental contact with toluene)
Respirator:	Refer to 29CFR1910.134 for selection of appropriate respiratory protection. Organic vapor cartridge with a ½ or full face mask, where toluene vapors do not exceed the assigned protection factor for the respirator. For unknown concentrations or IDLH atmospheres wear self-contained breathing apparatus or supplied air with escape bottle.

## Section 9 - Physical & Chemical Properties

Toluene	
Physical State:	Liquid
Color:	Brown-Black
Odor:	Distinct odor
Odor Threshold:	~10-15 ppm
Molecular Weight:	92.14
Boiling Point:	232° F (111° C)
Freezing Point:	-139° F (-95° C)
Vapor Pressure:	22mmHg @20° C
Vapor Density ( air = 1 ):	3.14
Specific Gravity ( water = 1 ):	0.8669
pH:	No data available

## Section 10 - Reactivity

Stability:	Stable at standard temperatures and pressure.
Conditions to avoid:	Avoid heat, sparks and other sources of ignition.
Incompatible:	Incompatible with oxidizing materials, halogens, acids, combustible materials and metal salts
Hazards Decomposition:	Combustion produces toxic by-products.
Polymerization:	Will not polymerize.

## Section 11 - Toxicological Information

Toluene	
Irritation Data:	300 ppm eyes-human; 435 mg skin-rabbit mild; 500 mg skin-rabbit moderate; 20mg/24hours skin-rabbit moderate
Toxicity Data:	719ul/kg oral-man LDLo; 50 mg/kg oral-human LDLo; 200 ppm inhalation-human TCLo; 100 ppm inhalation-man TCLo; 636 mg/kg oral-rat LD50; 49 gm/m3/4 hours inhalation-rat LC50; 1332 mg/kg intraperitoneal-rat LD50; 1960 mg/kg intravenous-rat LD50; 6900 mg/kg unreported-rat LD50; 400 ppm/24hours inhalation-mouse LC50; 59 mg/kg intraperitoneal-mouse LD50; 2250 mg/kg subcutaneous-mouse LD50; 2gm/kg unreported-mouse LD50; 14100ul/kg skin-rabbit LD50; 130mg/kg intravenous-rabbit LDLo; 1600 ppm inhalation-guinea pig LCLo
Local Effects:	Irritant; inhalation, skin, eye
Slightly Toxic:	Inhalation & dermal absorption
Moderately Toxic:	Ingestion

Toluene	
Target Organs:	Nervous system

Lead Sulfide	
Toxicity Data:	1810 mg/kg intraperitoneal-rat LDLo; 10gm/kg oral-guinea pig LDLo; 250 mg/kg intratracheal-rat LDLo; 16764 mg/kg/6 week(s) continuous oral-rat TDLo; 0.048 mg/m <sup>3</sup> / 6hours-183 days intermittent inhalation-rat TCLo.
Carcinogen status:	IARC; Human inadequate Evidence, Animal Sufficient Evidence, Group 2B (lead and inorganic Lead compounds); ACGIH: A3 – Animal carcinogen (lead and inorganic lead compounds) Renal tumors were produced in animals by lead acetate, subacetate and phosphate given orally, subcutaneously or intraperitoneally. No evaluation could be made of the carcinogenicity of other lead compounds.
Acute Inhalation Exposure:	Absorption of large amounts of lead may cause a metallic taste, thirst, burning sensation in the mouth and throat, salivation, abdominal pain with sever colic, vomiting, diarrhea of black or bloody stools, constipation, fatigue, sleep disturbances, dullness, restlessness, irritability, memory loss, loss of concentration, delirium, oliguria often with hematuria and albuminuria, encephalopathy with visual failure, paresthesias, muscle pain and weakness, convulsions, and paralysis.
Chronic Inhalation Exposure:	Prolonged or repeated exposure to low level of lead may result in an accumulation in body tissues and exert adverse effects on the blood, nervous system, heart, endocrine and immune systems, kidneys, and reproduction. Early stages of lead poisoning, "plumbism", may be evidenced by anorexia, weight loss, constipation, apathy or irritability, occasional vomiting, fatigue, headache, weakness, metallic taste in the mouth, gingival lead line in persons with poor dental hygiene, and anemia. Loss of recently developed motor skills is generally observed only in children. Lead crosses the placenta and may affect the fetus causing birth defects, mental retardation, behavioral disorders, and death during the first year of childhood. Animal studies indicate that reproductive effects may be additive if both parents are exposed to lead.
Skin exposure:	Contact with lead powders or dust may be irritating. Lead is not absorbed through the skin, but may be transferred to the mouth inadvertently by cigarettes, chewing tobacco, food, or make up.
Eye exposure:	Irritating effect.
Sensitization:	No sensitizing effects known.

PMMA	
Health effects:	No significant adverse effects are known. In solid form, may cause irritation when inhaled or ingested or with eye and skin contact. No data available for chronic or acute effects.

## Section 12 - Ecological Information

Do not allow material to be released to the environment (ground, air or water bodies). Lead can be toxic to a host of organisms and should not be released to the environment. Toluene is relatively non-persistent in the environment and accumulates very little in the bodies of living organisms.

## Section 13 - Transportation Information

U.S. DOT:	Class 3, packing group II, UN1294
Canadian Transportation of Dangerous Goods:	UN 1294 Class 3
Land Transport ADR/RID:	UN1294, Class 3, Class Code F1, Pack group II
Air Transport IATA/ICAO:	UN1294, Class or Division 3, pack group II
Exceptions:	49 CFR 173.4

## Section 14 - Disposal

U.S. EPA 40 CFR 262: Hazardous Waste Number: D001 (Flammable), U220 (toluene), Regulatory level of 5mg/L (Lead). D008 (lead)

Dispose in accordance with all applicable local, state and federal regulations.

## Section 15 - Regulatory Information

### US Regulations - Toluene

CERCLA: 1000 Lbs RQ  
 SARA Title III, sec. 302, 304: Not regulated  
 SARA Title III, Section 311/312  
 Acute: Yes  
 Chronic: Yes  
 Fire: Yes  
 Reactive: No  
 Sudden Release: No  
 US Inventory (TSCA) listed: Yes

### Canadian Regulations - Toluene

WHMIS Classification: Not available

### European Regulations - Toluene

EC Classification:  
 F Highly Flammable  
 Xn- Harmful

### EC Risk Phrases - Toluene

R11, R20, S2, S16, S25, S29, S33

### US Regulations - Lead Sulfide

CERCLA: 10 Lbs RQ  
 SARA Title III, sec. 302, 304: Not regulated  
 SARA Title III, Section 311/312:  
 Acute: Yes  
 Chronic: Yes  
 Fire: No  
 Reactive: No  
 Sudden Release: No  
 US Inventory (TSCA) listed: Yes

### Canadian Regulations - Lead Sulfide

WHMIS Classification: Not available

### European Regulations - Lead Sulfide

EC Classification:  
 Xn-Harmful  
 N-Dangerous for the Environment  
 Reproductive Toxin Category 1 & 3

### EC Risk Phrases - Lead Sulfide

R20/22, R33, R50/53, R61, R62, S45  
 S53, S60, S61

## Section 16 - Other 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. Evident Technologies shall not be held liable for any damage resulting from handling or from contact with the above product. See packing slip for additional terms and conditions of sale.

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