


Plasmaterials, Inc.
 2268 Research Drive
 Livermore, CA 94550
 Ph: (925) 447-4030 Fx: (925) 447-4031
<http://plasmaterials.com>

SAFETY DATA SHEET

Section 1- IDENTIFICATION		
COMPOSITION PbS		PRODUCT NAME Lead Sulfide
SUPPLIER: Plasmaterials, Inc. 2268 Research Drive Livermore, CA 94550 Ph: 925-447-4030	RECOMMENDED USE: Laboratory Chemicals Scientific Research	EMERGENCY TELEPHONE NUMBERS US: 001-800-424-9300 Europe: 001-703-527-3887

Section 2- HAZARD(S) IDENTIFICATION	
HEALTH HAZARDS: Acute Toxicity (Oral): Category 4 (H302) Acute Toxicity (Inhalation): Category 4 (H332) Carcinogenicity: Category 2 (H351) Reproductive Toxicity (Fertility, the unborn child): Category 1A (H360) Specific Target Organ Toxicity, Repeated Exposure: Category 2(H373)	ENVIRONMENTAL HAZARDS: -Hazardous to the Aquatic Environment, Acute Hazard: Category 1 (H400) -Hazardous to the Aquatic Environment, Long-Term Hazard: Category 1 (H410)
Physical Hazards: Not Classified	OSHA Defined Hazards: Not Classified
LABEL ELEMENTS: Signal Word: Danger	
	
HAZARD STATEMENTS: -H302: Harmful if swallowed. -H332: Harmful if inhaled. -H351: Suspected of causing cancer. -H360: May damage fertility or the unborn child. -H373: May cause damage to organs through prolonged or repeated exposure. -H400: Very toxic to aquatic life. -H410: Very toxic to aquatic life with long lasting effects.	
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. -P261: Avoid breathing dust -P264: Wash thoroughly after handling. -P270: Do not eat, drink, or smoke when using this product. -P271: Use only outdoors or in a well-ventilated area -P273: Avoid release to the environment -P280: Wear protective gloves/protective clothing/eye protection/face protection	

-P301+P312+P330: If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth.
 -P304+P340: If inhaled: Remove person to fresh air and keep comfortable for breathing.
 -P308+P313: If exposed or concerned: Get medical advice/attention.
 -P312: Call a poison center/doctor if you feel unwell.
 -P391: Collect spillage
 -P405: Store locked up.
 -P501: Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazards not otherwise classified (HNOC):
 -None identified.

Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Molecular Weight
Lead Sulfide	1314-87-0	239.27 g/mol

Section 4- FIRST AID MEASURES

GENERAL ADVICE: If exposed or concerned: get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

INHALATION: Remove victim from exposure to fresh air and keep at rest in a position comfortable for breathing. Give oxygen or artificial respiration if needed. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a poison control center or doctor/physician if you feel unwell.

SKIN CONTACT: Wash skin off with soap and plenty of water. Get medical attention if irritation develops and/or persists.

EYE CONTACT: Do not rub eyes. Flush eyes with plenty of water, lifting upper and lower lids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and/or persists.

INGESTION: Rinse mouth thoroughly. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content does not get into the lungs. Get medical advice/attention if you feel unwell.

MOST IMPORTANT SYMPTOMS/EFFECTS: Prolonged exposure may cause chronic effects.

NOTES TO PHYSICIAN: Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

Section 5- FIREFIGHTING MEASURES

Suitable Extinguishing Media:

Water Fog, Foam, Dry Chemical Powder, Carbon Dioxide (CO₂)

Unsuitable Extinguishing Media:

Do not use water jet as an extinguisher, as this will spread the fire.

Specific Hazards Arising from the Chemical: During fire, gases hazardous to health may be formed. Do not allow run-off from fire-fighting to enter drains or water courses.

Protective Equipment & Precautions for Firefighters: As in any fire, Firefighters must wear full face, self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective clothing to prevent contact with skin and eyes.

Specific Methods: Use standard firefighting procedures and consider the hazards of other involved materials. Use water spray to cool unopened containers. Move containers from fire area if you can do so without risk.

Hazardous Combustion Products: Sulfur oxides, Lead oxides, Lead

General Fire Hazards: No unusual fire or explosion hazards noted.

Section 6- ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

For personal protection, see Section 8 of SDS.

Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses, or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases.

Methods for Containment & Clean Up: Avoid dispersal of the dust in the air (i.e., clearing dust surfaces with compressed air). This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways. Stop the flow of material if this is without risk.

-Large Spills: Wet down with water and dike for later disposal. Absorb in vermiculite, dry sand or earth and place into containers. Shovel the material into waste container. Prevent entry into waterways, sewer, basements, or confined areas. Following product recovery, flush area with water.

-Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Wipe up with absorbent material (e.g., cloth, fleece). Clean surface thoroughly to remove residual contamination.

-Never return spills to original containers for re-use.

-Put material in suitable, covered, labeled containers.

-For waste disposal, see Section 13.

Section 7- HANDLING AND STORAGE

Handling: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Avoid breathing dust. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink, or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Use only outdoors or in a well-ventilated area. Wear appropriate personal protection equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices.

Storage: Store locked up. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of SDS)

Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Component	CAS-No.	Value	Control Parameters	Basis
Lead Sulfide	1314-87-0	TWA	0.05 mg/m ³	US OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
		TWA	0.05 mg/m ³	USA. ACGIH Threshold Limit Values
		TWA	0.05 mg/m ³	US NIOSH Pocket Guide to Chemical Hazards
		PEL	0.05 mg/m ³ (Dust and Fume)	US California Code of Regulations, Title 8, Section 5155, Airborne Contaminants
		TWA	0.03 mg/m ³ (Dust and Fume)	US California Code of Regulations, Title 8, Section 5155, Airborne Contaminants

Biological Limit Values:

Component	CAS-No.	Value	Determinant	Specimen
Lead Sulfide	1314-87-0	200 µg/l	Lead	Blood

Engineering Measures: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Control Parameters: Follow standard monitoring procedures.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety practice. Keep away from food and drink. Wash thoroughly after handling and before eating, drinking and/or smoking. Wash

hands before breaks and at the end of the workday. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace. Observe any medical surveillance requirements.

Personal Protective Equipment:

Eye/Face Protection: Wear safety glasses with side shields or goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin and Body Protection: Handle with chemical resistant gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection: In case of insufficient ventilation, wear suitable respiratory equipment. Use respirators and components tested and approved under appropriate government standards such as NIOSH/MSHA (US) or EN 149 (CEN) (EU).

Thermal Hazards: Wear appropriate thermal protective clothing, when necessary.

Section 9- PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid

Odor: No information available

Odor Threshold: No information available

pH: No information available

Melting Point/Range: 1114°C (2037.2°F)

Boiling Point/Range: 1281°C (2337.8°F)

Flash Point: No information available

Evaporation Rate: No information available

Flammability (solid,gas): No information available

Flammability or Exposure Limits:

Upper: No data available

Lower: No data available

Vapor Pressure: No information available

Vapor Density: No information available

Relative Density: No information available

Solubility: No information available

Partition coefficient; n-octanol/water: No information available

Auto Ignition Temperature: No information available

Decomposition Temperature: No information available

Viscosity: No information available

Density: 7.57-7.59 g/cm³ estimated

Specific Gravity: 7.57

Explosive Properties: No information available

Oxidizing Properties: No information available

Section 10- STABILITY AND REACTIVITY

Reactive Hazard: Stable and non-reactive under normal conditions of use, storage, and transport.

Stability: Stable under normal conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur.

Conditions to Avoid: Contact with incompatible products. Avoid dust formation.

Incompatible Materials: Strong oxidizing agents

Hazardous Decomposition Products: Sulfur oxides, Lead oxides, Lead

Section 11- TOXICOLOGICAL INFORMATION

Information on likely Routes of Exposure:

Inhalation: Harmful if inhaled.

Skin Contact: No adverse effects due to skin contact are expected

Eye Contact: Direct contact with eyes may cause temporary irritation

Ingestion: Harmful if swallowed

Symptoms Related to the Physical, Chemical & Toxicological Characteristics: Direct contact with eyes may cause temporary irritation.

Information on Toxicological Effects:

Acute Toxicity: Harmful if inhaled. Harmful if swallowed.

Skin Corrosion/Irritation: Prolonged skin contact may cause temporary irritation

Serious Eye Damage/Eye Irritation: Direct eye contact may cause temporary irritation

Respiratory Sensitization: Not a respiratory sensitizer

Skin Sensitization: Not expected to cause skin sensitization

Carcinogenicity: Suspected of causing cancer.

-IARC Monographs Overall Evaluation of Carcinogenicity: Lead Sulfide (CAS No. 1314-87-0) – 2A Probably carcinogenic to humans

-OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050): Not regulated

-US National Toxicology Program (NTP) Report on Carcinogens: Lead Sulfide (CAS No. 1314-87-0) – Reasonably anticipated to be a human carcinogen

Germ Cell Mutagenicity: No information available

Reproductive Toxicity: May damage fertility. May damage the unborn child.

Development Toxicity: May damage the unborn child.

Specific Target Organ Toxicity – single exposure: No information available

Specific Target Organ Toxicity – repeated exposure: May cause damage to organs through prolonged or repeated exposure. Central nervous system, Blood, Kidney

Aspiration Hazard: No information available

Chronic Effects: May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

-To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Section 12- ECOLOGICAL INFORMATION

Ecotoxicity: Very toxic to aquatic life with long lasting effects. May cause long-term adverse effects in the environment. Do not allow material to contaminate ground water system.

Component	CAS-No.	Freshwater Fish	Water Flea
Lead Sulfide	1314-87-0	Fathead minnow: LC50: 0.915 mg/l, 96 hours	Daphnia Magna: EC50: 0.138 mg/l 48 hours

Persistence and Degradability: No information available

Bioaccumulation/Accumulation: No information available

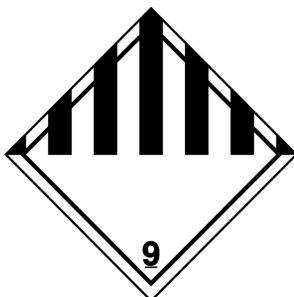
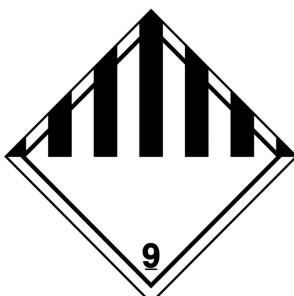
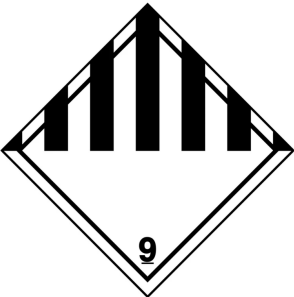
Mobility: No information available

Other Adverse Effects: No other adverse environmental effects are expected from this component.

Section 13- DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways, or ditches with chemical or used container. Dispose of contaminated packaging as unused product. Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14- TRANSPORT INFORMATION

<p>DOT:</p> <p>UN-No: UN3077 Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Lead Sulfide RQ = 10 LBS) Hazard Class: 9 Packing Group: III Environmental Hazards (Marine): Yes Special Precautions for User: Read safety instructions, SDS and emergency procedures before handling. Special Provisions: 8,146, 335, A112, B54, IB8, IP3, N20, T1, TP33 Packaging Exceptions: 155 Packaging Non-bulk: 213 Packaging Bulk: 240</p>	
<p>IATA:</p> <p>UN-No: UN3077 Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Lead Sulfide) Hazard Class: 9 Packing Group: III Environmental Hazards: No ERG Code: 9L Special Precautions for User: Read safety instructions, SDS and emergency procedures before handling. Passenger & Cargo Aircraft: Allowed with restrictions Cargo Aircraft Only: Allowed with restrictions</p>	
<p>IMDG:</p> <p>UN-No: UN3077 Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Lead Sulfide) Hazard Class: 9 Packing Group: III Environmental Hazards (Marine Pollutant): No EmS: F-A, S-F Special Precautions for User: Read safety instructions, SDS and emergency procedures before handling.</p>	

Section 15- REGULATORY INFORMATION

US Federal Regulations: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D): Not regulated

CERCLA Hazardous Substance List (40 CFR 302.4): Lead Sulfide (CAS No: 1314-87-0)

U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050): Lead Sulfide (CAS No: 1314-87-0) – Reproductive toxicity. Central nervous system. Kidney. Blood. Acute toxicity

Superfund Amendments and Reauthorization Act of 1986 (SARA):

Hazard Categories:

- Immediate Hazard – Yes
- Delayed Hazard – Yes

Fire Hazard – No
Pressure Hazard – No
Reactivity Hazard – No

SARA 302 Extremely Hazardous Substance: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

SARA 311/312 Hazardous Chemical: Yes

SARA 313 (TRI Reporting): 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

Safe Drinking Water Act (SWDA): Listed

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130): Hazardous substance. Priority pollutant.
Toxic pollutant

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Lead Sulfide (CAS No: 1314-87-0)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): Not regulated

US California Proposition 65: WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3 subd. (a)): Lead Sulfide (CAS 1314-87-0)

US California Proposition 65 – CRT: Lead Sulfide (CAS No: 1314-87-0) – Listed date: October 1, 1992

US Massachusetts Right-To-Know – Substance List: Lead Sulfide (CAS No: 1314-87-0)

US New Jersey Right-To-Know – Substances: Listed substance, Lead Sulfide (CAS No: 1314-87-0)

US Pennsylvania Right-To-Know – Hazardous Substances: Lead Sulfide (CAS No: 1314-87-0)

US Rhode Island Right-To-Know: Lead Sulfide (CAS No: 1314-87-0)

Section 16- OTHER INFORMATION

The above information is accurate to the best of our knowledge. However, since data, safety standards and government regulations are subject to change, the conditions of handling and use, or misuse are beyond our control, Plasmaterials, Inc. makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

The information in this SDS was obtained from sources, which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

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