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SAFETY DATA SHEET

Section 1- IDENTIFICATION		
COMPOSITION ZrS2		PRODUCT NAME Zirconium Sulfide
SUPPLIER: Plasmaterials, Inc. 2268 Research Drive Livermore, CA 94550 Ph: 925-447-4030	RECOMMENDED USE: Laboratory Chemicals Scientific Research	EMERGENCY TELEPHONE NUMBERS US: 800-424-9300 International: 001-703-527-3887

Section 2- HAZARD(S) IDENTIFICATION
Skin Irritation: Category 2 (H315)
Eye Irritation: Category 2A (H319)
Specific Target Organ Toxicity – Single Exposure: Category 3 (H335)
LABEL ELEMENTS: Signal Word: Warning

<p><u>HAZARD STATEMENTS</u></p> <p>-H315: Causes skin irritation -H319: Causes serious eye irritation -H335: May cause respiratory irritation</p> <p><u>PRECAUTIONARY STATEMENTS</u></p> <p>-P101: If medical advice is needed, have product container or label at hand -P102: Keep out of reach of children -P103: Read label before use -P260: Do not breath dust/fume/gas/mist/vapors/spray -P262: Do not get in eyes, on skin or on clothing -P280: Wear protective gloves/protective clothing/eye protection/face protection. -P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. -P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. -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.</p> <p>Hazards not otherwise classified (HNOC): -None identified.</p>

Section 3- COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	CAS-No	Molecular Weight
Zirconium Sulfide	12039-15-5	155.34 g/mol

Section 4- FIRST AID MEASURES

GENERAL ADVICE: Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. Show this safety data sheet to the physician in attendance.

INHALATION: Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. Consult a physician if symptoms develop or persist.

SKIN CONTACT: Wash off with soap and plenty of water. Consult a physician if irritation develops and/or persists.

EYE CONTACT: 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 or persists.

INGESTION: Rinse mouth with water. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

MOST IMPORTANT SYMPTOMS/EFFECTS: The most important known symptoms and effects are described in the labeling (see section 2) and/or in section 11. Direct contact with eyes may cause temporary irritation.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Provide general supportive measures and treat symptomatically.

Section 5- FIREFIGHTING MEASURES

Suitable Extinguishing Media: Dry Chemical Powder, Water Fog, Alcohol Resistant Foam, Carbon Dioxide (CO ₂)	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.	
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.	
Fire Fighting Equipment/Instructions: Use water spray to cool unopened containers. Use standard firefighting procedures and consider the hazards of other involved materials.	
General Fire Hazards: No unusual fire or explosive hazards noted.	

Section 6- ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep unnecessary personnel away. For personal protection see section 8.

Environmental Precautions: Avoid discharge into drains, water courses or onto the ground.

Methods for Containment & Clean Up:

Stop the flow of material, if this is without risk. Following product recovery, flush area with water. For waste disposal, see Section 13.

Section 7- HANDLING AND STORAGE

Handling: Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Storage: Store in originally tightly closed container. Store away from incompatible materials.

Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Occupational Exposure Limits/Components with Workplace Control Parameters:

Component	CAS-No.	Value	Control Parameters	Basis
Zirconium Sulfide	12039-15-5	TWA	5 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		STEL	10 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		PEL	5 mg/m ³	USA. Occupational Exposure Limits (OSHA) Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m ³	USA NIOSH Pocket Guide to Chemical Hazards Materials
		STEL	10 mg/m ³	USA NIOSH Pocket Guide to Chemical Hazards Materials
		PEL	5 mg/m ³	USA. California Code of Regulations, Title 8, Section 5155, Airborne Contaminants
		STEL	10 mg/m ³	USA. California Code of Regulations, Title 8, Section 5155, Airborne Contaminants

Appropriate Engineering Controls:

Good general ventilation 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. Handle in accordance with good industrial hygiene and safety practice. 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.

Biological Limit Values: No biological exposure limits noted for ingredient(s).

Control Parameters: Follow standard monitoring procedures

Personal Protective Equipment:

Eye/Face Protection: 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 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 suitable protective clothing. 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. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

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

General Hygiene: Always observe good personal hygiene measures such as washing after handling the material 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.

Section 9- PHYSICAL AND CHEMICAL PROPERTIES

Physical State/Form: Solid

Odor: No data available

Odor Threshold: No data available

pH: No data available

Melting Point/Range: No data available

Initial Boiling Point/Range: No data available

Flash Point: No data available

Evaporation Rate: No data available

Flammability (solid, gas): No data available

Flammability Limits:

Upper: No data available
Lower: No data available
Explosive Limits:
Upper: No data available
Lower: No data available
Vapor Pressure: No data available
Vapor Density: No data available
Relative Density: No data available
Solubility (Water): No data available
Partition coefficient; n-octanol/water: No data available
Auto Ignition Temperature: No data available
Decomposition Temperature: No data available
Viscosity: No data available
Explosive Properties: No data available
Oxidizing Properties: No data available

Section 10- STABILITY AND REACTIVITY

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

Stability: Stable under recommended storage conditions.

Conditions to Avoid: Contact with incompatible materials

Incompatible Materials: Strong oxidizing agents

Hazardous Decomposition Products: No data available

Hazardous Polymerization: No data available

Hazardous Reactions: No data available

Section 11- TOXICOLOGICAL INFORMATION

Information on likely Routes of Exposure:

Inhalation: Prolonged inhalation may be harmful

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

Eye Contact: Direct contact with eyes may cause temporary irritation

Ingestion: Expected to be a low ingestion hazard

Symptoms related to the physical, chemical and toxicological characteristics: Direct contact with eyes may cause temporary irritation

Information on Toxicological Effects:

Acute Toxicity: No information available

Inhalation: No information available

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

Serious eye damage/irritation: Direct contact with eyes may cause temporary irritation

Respiratory or Skin Sensitization: No data available

Carcinogenicity: This product is not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA

Germ Cell Mutagenicity: No data available

Reproductive Effects: No data available

Development Effects: No data available

Specific Target Organ Toxicity – single exposure: No data available

Specific Target Organ Toxicity – repeated exposure: No data available

Aspiration Hazard: No data available

Chronic Effects: Prolonged inhalation may be harmful

Additional Information:

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

Section 12- ECOLOGICAL INFORMATION

Toxicity: The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Persistence and Degradability: No information available

Bioaccumulation/Accumulation: No information available

Mobility in Soil: No information available

Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

Other Adverse Effects: No information available

Section 13- DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Collect and reclaim or dispose in sealed containers to a licensed disposal company. Dispose of contaminated packaging as unused product. Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 14- TRANSPORT INFORMATION

DOT: Not regulated as dangerous goods

IATA: Not regulated as dangerous goods

IMDG: Not regulated as dangerous goods

Section 15- REGULATORY INFORMATION

US Federal Regulations: This product is not known to be 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

U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050): Not Listed

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

SARA 304 Emergency Release Notification: Not Regulated

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

SARA 311/312 Hazardous Chemical: Yes

SARA Hazard Categories:

Immediate Hazard: No

Delayed Hazard: No

Fire Hazard: No

Pressure Hazard: No

Reactive Hazard: No

CERCLA Hazardous Substance List (40 CFR 302.4): Not Listed

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: No information available

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): No information available

Safe Drinking Water Act (SDWA): No information available

US California Proposition 65: This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

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.

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