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SAFETY DATA SHEET

Section 1- IDENTIFICATION

COMPOSITION		PRODUCT NAME
Mo		**Molybdenum**
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

Classification:
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

PHYSICAL HAZARDS: Not classified

HEALTH HAZARDS: Specific Target Organ Toxicity, Single Exposure: Respiratory Tract Irritation: Category 3 (H335)

Environmental Hazards: Not Classified | **OSHA Defined Hazards:** Not Classified

LABEL ELEMENTS: Signal Word: Danger

HAZARD STATEMENTS

-H335: May cause respiratory irritation

PRECAUTIONARY STATEMENTS

-P261: Avoid breathing dust, fume, gas, mist, vapor, spray
-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
-P280: Wear protective gloves, protective clothing, eye protection and face protection
-P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing
-P312: Call a poison center/doctor if you feel unwell
-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

Hazards not otherwise classified (HNOC):
-None known

Section 3- COMPOSITION/INFORMATION ON INGREDIANTS

COMPONENT	CAS-No	Molecular Weight
Molybdenum	**7439-98-7**	**95.94 g/mol**

Section 4- FIRST AID MEASURES

GENERAL ADVICE: If exposed or concerned, get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
INHALATION: Remove victim from exposure to fresh air. Give oxygen if breathing is difficult. If not breathing, give artificial respiration. Call a physician if symptoms develop or persist.
SKIN CONTACT: Wash off with soap and plenty of water. Get medical attention if irritation develops and persists.
EYE CONTACT: Flush eyes with lukewarm 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 persists.
INGESTION: Rinse mouth with water. Never give anything by mouth to an unconscious person. Get medical advice/attention if you feel unwell.
MOST IMPORTANT SYMPTOMS/EFFECTS: The most important known symptoms and effects are described in the labeling (see section 2). Diarrhea. Dusts may irritate the respiratory tract, skin and eyes.
INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED: Provide general supportive measures and treat symptomatically. Symptoms may be delayed.

Section 5- FIREFIGHTING MEASURES

Suitable Extinguishing Media:	**Unsuitable Extinguishing Media:**
Water Fog, Alcohol-Resistant Foam, Dry Chemical Powder, Carbon Dioxide (CO2)	None Known

Specific Hazards Arising from the Chemical:
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.

Firefighting Instructions/Specific Methods:
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 explosion hazards noted.

Section 6- ACCIDENTAL RELEASE MEASURES

Personal Precautions: Ensure adequate ventilation. Avoid breathing dust, vapors, mist or gas. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Keep unnecessary personnel away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained. For personal protection see Section 8.

Environmental Precautions: Do not contaminate water. Avoid discharge into water courses, drains and onto the ground.

Methods for Containment & Clean Up: Avoid dispersal of dust in the air (i.e. clearing dust surfaces with compressed air). Collect dust using a vacuum cleaner equipped with a HEPA filter. The product is immiscible with water and will spread over the water surface. Prevent entry into waterways, sewer, basements or confined areas. Never return spills to original containers for re-use. Keep in suitable, closed containers for disposal. For disposal see Section 13.

Section 7- HANDLING AND STORAGE

Handling: Further processing of solid materials may result in the formation of combustible dusts. The

potential for combustible dust formation should be taken into consideration before additional processing occurs. Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Avoid breathing dust. Avoid prolonged exposure. Wear appropriate personnel protective equipment. Avoid release to the environment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash hands thoroughly after handling.

Storage: Store locked up. Store in original tightly closed container. Store in a cool, dry, well-ventilated place out of direct sunlight.

Section 8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines:

Occupational Exposure Limits/Components with Workplace Control Parameters:

Component	CAS-No.	Value	Control Parameters	Basis
Molybdenum	7439-98-7	TWA	10 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	3 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) Table Z-1 Limits for Air Contaminants
		PEL	15 mg/m3	USA. Occupational Exposure Limits (OSHA) Table Z-1 Limits for Air Contaminants
		PEL	10 mg/m3	California Permissible Exposure Limits for Chemical Contaminants (Title 8, Article 107)
		PEL	3 mg/m3	California Code of Regulations, Title 8, Section 5155.Airborne Contaminants

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

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. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. If material is ground, cut or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. 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.

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 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: Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dusk 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: Solid
Odor: No data available

Odor Threshold: No data available
pH: No data available
Melting Point/Range: 2622°C / 4751.6°F
Boiling Point/Range: 4639°C / 8382.2°F
Flash Point: No data available
Evaporation Rate: No data available
Flammability (solid,gas): No data available
Flammability or Exposure Limits:
Upper: No data available
Lower: No data available
Vapor Pressure: No data available
Vapor Density: No data available
Relative Density: 10.28 g/cm3
Solubility: 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: Dust may irritate respiratory system. Prolonged inhalation may be harmful.
Skin Contact: Due to lack of data the classification is not possible. Dust or powder may irritate the skin.
Eye Contact: Dust may irritate the eyes.
Ingestion: Due to lack of data the classification is not possible

Symptoms related to the physical, chemical and toxicological characteristics: Diarrhea. Dusts may irritate the respiratory tract, skin and eyes.

Information on Toxicological Effects:

Acute Toxicity: May cause respiratory irritation
Skin Corrosion/Irritation: No data available
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: Respiratory tract irritation

Specific Target Organ Toxicity – repeated exposure: No data available
Aspiration Hazard: No data available
Chronic Effects: Prolonged inhalation may be harmful
Additional Information: RTECS: QA4680000
-To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated.

Section 12- ECOLOGICAL INFORMATION

Toxicity: Contains a substance which causes risk of hazardous effects to the environment.
Toxicity to Fish:
-Fish – LC50 – Rainbow trout, Donaldson trout (Oncorhynchus mykiss) – 800 mg/l – 96.0 h
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 at licensed waste disposal site. Dispose of contaminated packaging as unused product. This material and its container must be disposed of as hazardous waste. 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 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/IMO: Not regulated as dangerous goods

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. All components are on the US EPA TSCA Inventory List.
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 regulated
CERCLA Hazardous Substance List (40 CFR 302.4): Not listed
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302
SARA 313: 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 Hazards: Yes
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List: Not regulated
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130): Not regulated
Clean Water Act (CWA) Section 112 (r) (40 CFR 68.130): Priority pollutant – Toxic pollutant
Safe Drinking Water Act (SDWA): Not regulated
US Massachusetts Right to Know:

Component	CAS No.	Revision Date
Molybdenum	7439-98-7	1993-02-16

US New Jersey Right to Know:

Component	CAS No.	Revision Date
Molybdenum	7439-98-7	1993-02-16

US Pennsylvania Right to Know:

Component	CAS No.	Revision Date
Molybdenum	7439-98-7	1993-02-16

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.
US California Candidate Chemicals List Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3 subd. (a)): Molybdenum (CAS-No: 7439-98-7)

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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REVISION: 07-26-18