

Molybdenum

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer/Supplier:

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 * Fax (541) 488-8313

E-Mail: sales@espimetals.com

Product Name: Molybdenum

Formula: Mo

CAS Number: 7439-98-7

II. HAZARDOUS INGREDIENTS

Hazardous Component: Molybdenum

Percent (%): 0-100

OSHA/PEL 15 mg/m³

ACGIH/TLV 10 mg/m³

HMIS Ratings (Solid):

Health: 0

Flammability: 0

Reactivity: 0

HMIS Ratings (Powder):

Health: 1

Flammability: 2

Reactivity: 1

III. PHYSICAL DATA

Boiling Point: 5560 °C

Melting Point: 2610 °C

Specific Gravity: 10.2 g/cc

Solubility in H₂O: Insoluble

Appearance and Odor: Gray metal or gray-black powder, no odor.

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A

Autoignition Temperature: N/E

Flammable Limits: Lower: N/A Upper: N/A

Extinguishing Media: **For powder fires:** Use special powder for metal fires. Do not use water. **For fires involving solid forms:** Use suitable extinguishing media for surrounding materials and type of fire.

Special Firefighting Procedures: Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes.

Unusual Fire and Explosion Hazards: Flammable in the form of dust or powder (below 9 microns), which may ignite during intensive mechanical treatment. When heated to decomposition, molybdenum may emit toxic metal oxide fumes. May have a violent reaction with oxidizing agents. Molybdenum oxidizes rapidly above 1000 °F in air at sea level. Dust-air mixtures may be explosive. Combines with oxygen on heating to form MoO₃.

V. HEALTH HAZARD INFORMATION

Effects of Exposure:

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

Molybdenum compounds are poison by subcutaneous and intraperitoneal routes. Molybdenum and its compounds are highly toxic based upon animal experiments. Symptoms of acute poisoning include severe gastrointestinal irritation with diarrhea, coma and deaths from heart failure. Experimental animals exposed to high levels accumulated Mo in the lungs, spleen and heart, and showed a decrease of DNA and RNA in the liver, kidneys and spleen. (Sax, Dangerous Properties of Industrial Materials)

Acute Effects:

Inhalation: May cause irritation to the upper respiratory system.

Ingestion: May cause acute molybdenum poisoning.

Skin: May cause irritation.

Eye: May cause irritation.

Chronic Effects:

Inhalation: May cause pneumoconiosis, anemia, hyperthyroidism, abnormal liver function test, increased susceptibility to gout.

Ingestion: May cause chronic molybdenum poisoning.

Skin: No chronic effects recorded.

Eye: No chronic effects recorded.

Target Organs: May affect the lungs, bones, spleen, respiratory system, nervous system, liver, blood and heart.

Medical Conditions Aggravated by Exposure: Pre-existing lung disorders.

Carcinogenicity: NTP: No IARC: No OSHA: No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove to fresh air, keep warm and quiet, give oxygen if breathing is difficult and seek medical

attention.

INGESTION: Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person.

SKIN: Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water. If irritation persists, seek medical attention.

EYE: Flush eyes, including under upper and lower eyelids, with lukewarm water. If irritation persists seek medical attention.

VI. REACTIVITY DATA

Stability: Stable

Conditions to Avoid: Creation or accumulation of dust and sources of ignition.

Incompatibility (Material to Avoid): Oxidizing agents, acids, bromine trifluoride, chlorine trifluoride, fluorine, lead dioxide.

Hazardous Decomposition Products: Molybdenum, molybdenum trioxide and other molybdenum oxide fumes.

Hazardous Polymerization: Will not occur

VII. SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Wear appropriate respiratory and protective equipment specified in section VIII. Ventilate area of spill. Remove all sources of ignition. Clean-up using methods which avoid dust generation such as vacuuming (with HEPA filter), wet dust mop or wet clean-up.

Waste Disposal Method: Dispose of in accordance with Federal, State and Local regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved respirator

Ventilation: Use local exhaust ventilation to control any air contaminants to within recommended limits during the use of this product. General exhaust is recommended.

Protective Gloves: Rubber gloves

Eye Protection: Safety glasses

Other Protective Clothing or Equipment: Protective gear suitable to prevent contamination.

IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in a cool, dry area. Store powders and/or pieces in a tightly sealed container. Wash thoroughly after handling.

Other Precautions: Keep away from heat, sparks and flame. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat. Under normal conditions of use this product is non-hazardous. However, if this product is ground or otherwise processed flammable dusts or toxic metal oxide fumes may be generated.

Work Practices: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing or skin with compressed air. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

TSCA Listed: Yes

DOT Regulations:

Solid Forms:

Hazard Class: None

Powders:

Hazard Class: 4.1

Identification Number: UN3089

Packing Group: III

Proper Shipping Name: Metal powder, flammable, n.o.s. (molybdenum)

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

Issued by: S. Dierks

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