



MATERIAL SAFETY DATA SHEET
COMPLIES WITH 29 CFR 1910.1200.
OSHA HAZARD COMMUNICATION RULE

DATE OF LAST REVISION: 05-13-96

CHEMICAL IDENTITY

LABEL IDENTITY	MOLYBDENUM SULFIDE
CHEMICAL NAME/SYNONYMS	MOLYBDENUM DISULFIDE, III SULFIDE
FORMULA	MoS₂
CHEMICAL FAMILY	METAL SULFIDE
CAS REGISTRY NUMBER	1317-33-5, LISTED ON TSCA.
HAZARDOUS INGREDIENTS	MOLYBDEMUM, 100%, (AS Mo)
(0.1-1% TUNGSTEN UNLESS SPECIFIED)	TLV: 5mg/m³, OSHA PEL: 5mg/m³

PHYSICAL AND CHEMICAL PROPERTIES

COLOR, FORM	Black lustrous powder
ODOR	rotten egg like odor
BOILING POINT	Decomposes in air (sublimes @ 450)
DENSITY (gm/cc)	4.80 at 14°
VAPOR PRESSURE @ 20°	NA
% VOLATILE BY VOLUME (%)	NA
REACTION WITH WATER	May form H₂S
EVAPORATION RATE (H ₂ O=1)	NA
SOLUBILITY IN WATER	Insoluble
MELTING POINT	1185 (2375)
OTHER	Soluble in hot water, aqua regia, HNO₃, insoluble in dilute acid

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	NA
AUTOIGNITION TEMPERATURE (°C)	NA
FLAMMABILITY	Non-flammable
EXTINGUISHING MEDIA	Use dry chemical, CO₂. DO NOT USE WATER.
SPECIAL FIRE FIGHTING PROCEDURES	Wear a self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.
UNUSUAL FIRE & EXPLOSION HAZARDS	May emit toxic fumes of Sox & H₂S if involved in a fire or on contact with acids or acidic fumes. Sulfides are moderate fire hazards when exposed to flame or spontaneous chemical reaction. Ignites easily at room temperature. Upon contact with acids or moisture H₂S is evolved. Oxidizers on contact with sulfides ignite vigorously.



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HEALTH HAZARD INFORMATION

TOXICITY DATA **MoO₂ data: scu-mus** **LD50: 318mg/kg**
HMIS RATING:
HEALTH: **3** FLAMMABILITY: **1** REACTIVITY: **2** PERSONAL PROTECTION: **J**

ROUTES OF ENTRY INHALATION: **Yes**
SKIN: **Yes**
INGESTION: **Yes**

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: **Respiratory Disorders**
EFFECTS OF OVEREXPOSURE (acute and chronic):

INHALATION: **Respiratory irritant. Coughing sneezing, difficulty breathing and pulmonary edema possible. May cause irritation of the mucous membranes of the nose and throat.**

DERMAL/EYE CONTACT: **Irritation to the skin may cause redness, inflammation and dermatitis. Irritation to the eyes may cause inflammation, redness, watering and risk of serious injury.**

OTHER: **Sulfides cause softening and irritation of the skin. Taken by mouth they are corrosive and irritating through the liberation of H₂S and free alkali.**

CARCINOGENICITY: **No** NTP: **No** IARC MONOGRAPHS: **No** OSHA REGULATE: **No**

EMERGENCY FIRST AID PROCEDURES:

INGESTION: **1-2 cups of milk or water to induce vomiting, seek medical attn.**

INHALATION: **Remove victim to fresh air, administer oxygen if breathing is difficult and seek medical attention immediately.**

SKIN CONTACT: **Brush material off skin. Wash affected area with soap and water and seek medical attention immediately.**

EYE CONTACT: **Flush eyes with water for 15 minutes. seek medical attention.**

REACTIVITY DATA

STABILITY	Stable
CONDITIONS CONTRIBUTING TO INSTABILITY	Heat
INCOMPATIBILITY (MATERIALS TO AVOID)	Potassium Nitrate, violent reaction with H₂O₂
HAZARDOUS DECOMPOSITION PRODUCTS	Mo, MoO_x, SO_x, S and H₂S
HAZARDOUS POLYMERIZATION	Will Not Occur
CONDITIONS TO AVOID	Heat, excessive moisture/water



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SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Wear self-contained breathing apparatus and full protective clothing. Isolate area, insure proper ventilation and water/moisture is kept out of area, vacuum spill (use high efficiency unit) and place in container for proper disposal.

WASTE DISPOSAL METHOD:

Consult federal, state and local regulations for proper disposal.

SPECIAL PROTECTIVE INFORMATION

RESPIRATORY PROTECTION	NIOSH/MSHA approved dust-mist-fume cartridge respirator
LOCAL EXHAUST	Maintain below TLV
MECHANICAL (general)	Recommended
SPECIAL	Handle in dry, controlled atmosphere
OTHER	NA
PROTECTIVE GLOVES	Neoprene
EYE PROTECTION	Safety glasses
OTHER PROTECTIVE EQUIPMENT	Wear protective clothing to prevent contamination of skin and clothes

SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:

Store in tightly closed container, store in cool, dry place, wash hands and face thoroughly after handling and before meals.

TRANSPORTATION REQUIREMENTS	DOT CLASS: Not Classified
	UN NUMBER: N. C.
	IMCO CLASS: N. C.
	OTHER: SPC, Corrosive

PRECAUTIONARY LABELING **NONE**

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, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND