E0237

Oak Ridge National Laboratory
Oak Ridge, Tennessee 37831

IBO-MSDS-00479

MATERIAL SAFETY DATA SHEET

The issuance of this document complies with the U. S. Department of Labor, Occupational Safety and Health Administration's (OSHA) Hazard Communication Standard 29 CFR 1910.1200. Standard must be consulted for specific requirements.

Definitions:

ACGIH	American Conference of Governmental Industrial Hygienists		
NIOSH	National Institute for Occupational Safety and Health		
NE	Not Established	**NISS**	Not In Sources Searched
NA	Not Applicable	**TLV**	Threshold Limit Value
TWA	Time Weighted Average	**PEL**	Permissible Exposure Limit

2006

IDENTITY (As used on label and list): Molybdenum (-92, -94, -95, -96, -97, -98, -100) Metal Powder

SECTION I. Manufacturer's Identification

Manufacturer's Name:

UT-Battelle
c/o Oak Ridge National Laboratory
Isotope Business Office
P. O. Box 2008
Oak Ridge, Tennessee 37831

Emergency Telephone Number:
Lab Shift Superintendent **(865) 574-6606**
Telephone Number for Assistance:
Isotope Business Office **(865) 574-6984**

Date Prepared: 06-March-1987
Date Reviewed: 25-July-2003

SECTION II. Hazardous Ingredients/Identity Information

Exposure Limits:
OSHA: TWA 10 mg(Mo)/m^3 total dust, 5(Mo)mg/m^3 respirable fraction for insoluble compounds.
ACGIH TLV: TWA 10 mg(Mo)/m^3 for insoluble compounds (1989/90)
NIOSH: NE
Immediately Dangerous to Life and Health: NE

Chemical Formula: Mo
CAS Registry Number: 007439-98-7
RTECS Number: QA4680000
Health Hazard Rating: 1, slight health hazard
Fire Hazard Rating: 1, slightly flammable
Reactivity Rating: 0, nonreactive
DOT Class: 4.1, Flammable Solid
DOT Label: Flammable Solid
DOT Number: UN 3089

SECTION III. Physical/Chemical Characteristics

Physical Description: Dark-gray or black powder with metallic luster or mass of silver-white color.
Molecular Weight (naturally occurring): 95.94
Melting Point: 2622°C
Boiling Point: ~4825°C
Specific Gravity: 10.2 (water=1)
Evaporation Rate: NISS
Vapor Pressure: 1 mm Hg @ 3102°C
Vapor Density: NISS
Percent Volatiles: NISS
Solubility: Insoluble in water.

SECTION IV. Fire and Explosion Hazard Data

Flash Point (method): NISS
Autoignition Temperature: NISS
Lower Flammability Limit: NISS
Upper Flammability Limit: NISS
Extinguishing Media: Use dry sand, carbon microspheres, dolomite, Met-L-X, or extinguishing media suitable for surrounding materials.
Firefighting Procedures: Firefighting techniques should concentrate on controlling the spread of the fire to other combustible materials. Wear pressure-demand, self-contained breathing apparatus and full firefighting protective clothing.
Fire and Explosion Hazards: Flammable or explosive in the form of dust; when exposed to heat or flame.

SECTION V. Reactivity Data

Stability: Unstable: ____ Stable: X
Conditions to Avoid: NISS
Incompatibility (materials to avoid): Oxidants (e.g., bromine trifluoride; bromine pentafluoride; chlorine trifluoride; potassium perchlorate; nitryl fluoride; fluorine; iodine pentafluoride; sodium peroxide; lead dioxide).
Hazardous Decomposition or Byproducts: Molybdenum fumes.
Hazardous Polymerization: May Occur: ____ Will Not Occur: X

SECTION VI. Health Hazard Data

Routes of Entry:	Inhalation: X Skin: ____ Ingestion: X
Signs and Symptoms of Exposure:	
Acute Inhalation:	Dust may be irritating to nose, throat, and respiratory tract Fumes may cause metal fume fever.
Acute Swallowing:	Insoluble and no toxic effect expected after ingestion.
Acute Skin Contact:	Irritant.
Acute Eye Contact:	Particles may be irritating.
Chronic:	Pneumoconiosis reported in workers exposed to metallic molybdenum and MoO_3 for 4-7 years.
Health Hazards (Target organs/systems):	
Acute:	Cardiovascular system, central nervous system, digestive system, endocrine system, eyes, kidneys (nephrotoxin), liver (hepatotoxin), musculoskeletal system, reproductive system, respiratory system, skin (cutaneous hazard).
Chronic:	Respiratory system.
Emergency and First Aid Procedures:	
Inhalation:	Remove to fresh air and give artificial respiration if not breathing. Get medical aid.
Swallowing:	Induce vomiting only after massive ingestion.
Skin contact:	Remove contaminated clothing and wash skin with plenty of water.
Eye contact:	Flush eyes at once with water for at least 15 minutes. Get medical aid.
Physicians' notes:	NISS

Carcinogenicity: NTP No IARC Monographs No OSHA Regulated No

Medical Conditions Generally Aggravated by Exposure: NISS

SECTION VII. Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled: Notify safety personnel of leaks or spills. Remove spills by vacuuming or wet sweeping in order to keep airborne dust at a minimum.

Waste Disposal Method: Collect in an appropriate container for salvage or disposal. Treat unsalvageable waste as a toxic solid in accordance with federal, state, and local regulations.

Precautions to be Taken in Handling and Storing: Store in closed container in a cool, dry, well-ventilated, low fire-risk area. Protect container from physical damage.

Other Precautions: Avoid breathing dust. Avoid skin and eye contact. Eyewash stations and washing facilities should be accessible to areas of use.

SECTION VIII. Control Measures

Respiratory Protection (specify type):	Use a NIOSH-approved inorganic dust respirator when dust levels exceed the PEL.
Ventilation:	
Local Exhaust:	Employ to keep dust below the TLV levels.
Mechanical (general):	Employ to keep dust below the TLV levels.
Special:	NISS
Other:	NISS
Protective Gloves:	Compatible chemical resistant gloves.
Eye Protection:	Wear approved chemical safety goggles/glasses.
Other Protective Clothing or Equipment:	Wear protective clothing.
Work/Hygienic Practices:	Wash thoroughly after handling.

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