

Molybdenum Disulphide (MoS₂) usage policy

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Key Danger from Chemical

NFPA RATINGS: HEALTH = 1 FIRE = 1 REACTIVITY = 0

Hazard statement :

Emergency overview:

Supplied in single crystal "chunks". Not considered hazardous. The materials can be cleaved ("micaceous cleavage") to expose freshly cleaved surfaces, a procedure that is generally not expected to generate a particulates hazard. If the material is cut with a scissors, or scored with a diamond scribe, then it could be expected that particulates would be generated.

Potential Health Hazards:

Skin:

Not considered hazardous, though dust, if generated could be irritating.

Eyes:

Not considered hazardous. May cause mechanical irritation if particles are generated and they should get into the eye.

Inhalation:

Not a route of exposure under normal usage, unless the materials is excessively cut or even ground, to generate dust particles. May be harmful if inhaled over a long period of time and may also cause delayed lung injury. Always avoid breathing dust of this material.

Ingestion:

Not a route of exposure. Not considered hazardous.

Delayed Effects:

None known.

Conditions Aggravated by Exposure:

No known conditions are aggravated by this material.

Effects of Over Exposure:

Shortness of breath or dry cough are the first symptoms. If such symptoms occur, remove to fresh air and contact physician.

Carcinogenicity:

Molybdenum disulfide is not listed as a carcinogen or potential carcinogen by the National Toxicology Program of the U. S. Public Health Service, nor has it been found to be a carcinogen or potential carcinogen by OSHA or the Int'l Agency for Research on Cancer.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
None found			

Potential health effects :

INHALATION: ACUTE EXPOSURE: No specific data available.

Insoluble molybdenum compounds are characterized by low toxicity.

CHRONIC EXPOSURE: 25 one-hour exposures to 490 mg/m³ caused no effects in all the animals tested except one which died after the third exposure.

SKIN CONTACT: ACUTE EXPOSURE: Dermatitis has not been reported in exposed workers.

CHRONIC EXPOSURE: No data available.

EYE CONTACT: ACUTE EXPOSURE: No specific data available.

Some insoluble molybdenum compounds are irritating to the eyes.

CHRONIC EXPOSURE: No data available.

INGESTION: ACUTE EXPOSURE: No data available.

CHRONIC EXPOSURE: Rats fed up to 500 mg daily for 44 days showed no toxic signs and all gained weight

Possibility of hazardous reactions :

Normally stable

Materials to avoid :

Hydrogen Peroxide, Potassium Nitrate

Hazardous decomposition products :

Molybdenum oxide fumes, Sulfur dioxide gas and Carbon monoxide

Signs and Symptoms of Exposure :

INHALATION: Possible irritant.

SKIN CONTACT: Possible irritant.

EYE CONTACT: Possible irritant.

INGESTION: Possible vomiting.

Fire fighting measures :

Flammable Properties

Flash Point: Non-flammable, Non explosive; therefore not applicable.

Flash Point Method: Not applicable.

Autoignition Temperature: Not determined.

Upper flame limit (volume % in air):

Not applicable. Non-volatile solid. Lower flame limit (volume % in air): Not applicable. Non-volatile solid.

Flame propagation rate (solids):

Not determined.

OSHA Flammability class:

Not determined.

Extinguishing Media:

Use whatever would be appropriate for the surrounding fire.

Unusual Fire and Explosion Hazards:

Material will produce sulfur dioxide when burned. Violent reaction with hydrogen peroxide can occur.

Special Fire Fighting Precautions/Instructions:

None

Accidental release measures :

In Case of Spill or Other Release:

(Always wear recommended personal protective equipment.) Collect and place in a solid waste container. Material is not dangerous if spilled. Wash away with water or vacuum with high efficiency HEPA filter. Powder or flakes of the material could become slippery and constitute a "slip and fall" hazard.

In the unlikely event MoS₂ containing material did get out into the environment, remember it can be absorbed by vermiculite, dry sand, earth, or similar materials.

Handling and Storage:

Normal Handling:

(Always wear recommended personal protective equipment). Use normal personal hygiene and good housekeeping.

Storage Recommendations:

No special recommendations. However, to extend the shelf life of the products, it is recommended that material be stored in dry environment.

Operating Procedure :

Semiconductor Material used for exfoliation on SiO₂ deposited on top of silicon wafers.

Disposal :

RCRA

Is the unused product a RCRA hazardous waste if discarded? **No.**

Other Disposal Considerations:

Dispose of in compliance with Federal, state and local government regulations.

Duration of Experiment : 4 years (2013–2017)