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Manufacturer's CAGE: 1P573

Material Safety Data Sheet

SPI # 429ML-AB, 429MM-AB and 429MS-AB [molybdenum disulfide single crystals](#)

Section 01 Identification

Date Effective..... January 8, 2009
(most recent revision)

Chemical Name/Synonyms... Molybdenum disulfide

Product Use..... Substrates for
scanning probe
microscopy analysis

Chemical family..... N/A

Emergencies Contacting CHEMTREC 24 Hour Emergency
Use Only #'s..... Worldwide phone : 1-(703)-527-3887
Worldwide FAX : 1-(703)-741-6090
Toll-free phone : 1-(800)-424-9300 USA only

Product or Trade Name.... SPI-Chem™ Moly Disulfide (MoS₂)

CAS #..... 1317-33-5

Chemical Formula..... MoS₂

Section 2 Composition / Information on Ingredients

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Molybdenum disulfide	1317-33-5	99.8+%

RTECS No.: QA4697000

OSHA PEL: 10 mg/m³

T Dust (Mo)

ACGIH TLV: 10 mg/m³ (Mo)
ACGIH STEL: N/P

Section 3: Hazard Identification

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			

Section 4: First Aid Measures

Take proper precautions to ensure your own health and safety before attempting to rescue and providing first aid. For specific information refer to the Emergency Overview in Section of this MSDS.

Skin:

Not hazardous if used as microscopy substrate materials. If particulates are being generated and the skin is contaminated, wash thoroughly with soap and water.

Eyes:

None needed under normal usage. If material comes into contact with the eye, flush eyes with water while holding eyelids apart to ensure complete irrigation. When cleaving, always wear safety glasses. In general, even when cleaving, we do not expect this to become an eye hazard.

Inhalation:

None needed under normal usage. If particulates are being generated, then victim should be at once removed to fresh air and if respiratory distress continues, a physician contacted.

Ingestion:

None needed.

Advice to physician:

None.

Section 5: 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

Section 6: 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.

Section 7: 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, we would recommend that material be stored in dry environment.

Section 8: Exposure Controls and Personal Protection

Engineering Controls:

None needed if material is used as it was intended to be used, that is, as a substrate for microscopy research and testing. But if the material is processed, and particulates are generated, the one must use NIOSH/MSHA approved respirators if the TLV is exceeded.

Personal Protective Equipment:

Safety glasses if cleaving or cutting operations are anticipated.

Skin Protection:

Not normally required unless cutting or grinding is contemplated.

Eye Protection:

As a general practice in manufacturing areas, safety glasses that conform to ANSI Z87.1 should be worn.

Respiratory Protection:

Under normal usage, not normally required. A NIOSH/MSHA approved respirator should be worn in areas where the PEL/TLV is exceeded.

Additional Recommendations:

Use protective rubber gloves on hands and safety goggles on the face.

Exposure Guidelines

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER	LIMIT
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No ingredients listed in this section.

Other Exposure Limits for Potential Decomposition of Products

Not known

Section 9: Physical and Chemical Properties

Appearance: Purple to crimson in color

Physical state: Solid.

Odor: None.

Specific Gravity (water = 1.0): 4.8

Solubility in Water (weight%): Negligible

pH: Not applicable.

Boiling Point: Decomposes

Melting Point: Not applicable

Vapor Pressure: None at room temperature

Vapor Density (air = 1.0): Not applicable

Evaporation Rate: Does not evaporate or sublime

% Volatiles: Negligible.

Flash Point: Not applicable.

Section 10: Stability and Reactivity

Normally Stable? (Conditions to Avoid)

Normally stable.

Materials to avoid:

Potassium nitrate, hydrogen peroxide

Incompatibilities:

None known other than above.

Hazardous Decomposition Products:

Molybdenum oxide fumes, sulfur dioxide gas and carbon monoxide

Hazardous Polymerization:

Will not occur.

Section 11: Toxicological Information

Immediate (Acute) Effects:

Not determined.

Delayed (Subchronic and Chronic) Effects:

None known.

Other Data:

None.

Section 12: Ecological Information

Exotoxicity:

Exotoxicity is expected to be low based on the zero water solubility of the material. Material is considered inert and not expected to be biodegradable or toxic.

Bioaccumulation:

Not expected to occur.

Section 13: Disposal Considerations

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.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

Section 14: Transport Information

US DOT Hazard Class: Not regulated.

US DOT ID Number: Not applicable, none assigned.

Section 15: Regulatory Information

Toxic Substances Control Act (TSCA)

TSCA Inventory Status: Listed on the TSCA Inventory.

Other TSCA Issues: None.

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME SARA/CERCLA RQ (lb) SARA EHS TPQ (lb)
No ingredients listed in this section.

Spills resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (1-800-424-8802) and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: None.

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
No ingredients listed in this section.	

State Right-To-Know

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section.		

WHMIS Classification (CANADA):

Not a controlled substance. (Considered to be a manufactured article.)

Foreign Inventory Status:

The material is listed on the EINECS Inventory.

California Prop. 65:

Proposition 65 requires manufacturers or distributors of consumer products into the State of California to provide a warning statement if the product contains ingredients for which the State has found to cause cancer, birth defects or other reproductive harm. If this product contains an ingredient listed by the State of California to cause cancer or reproductive toxicity, it will be listed below:

None present.

Section 16: Other Information

Disclaimer of Liability:

Caution! Do not use SPI Supplies products or materials in applications involving implantation within the body; direct or indirect contact with the blood pathway; contact with bone, tissue, tissue fluid, or blood; or prolonged contact with mucous membranes. Products offered by SPI Supplies are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. SPI Supplies will not provide to customers making devices for such applications any notice, certification, or information necessary for such medical device use required by US FDA (Food and Drug Administration) regulation or any other statute. SPI Supplies and Structure Probe, Inc. make no representation, promise, express warranty or implied warranty concerning the suitability of these materials for use in implantation in the human body or in contact with internal body tissues of fluids.

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