

Material Safety Data Sheet

For Emergency Source Information

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Section 1 - Chemical Product and Company Identification

SUBSTANCE: Sodium Molybdate Anhydrous, Dihydrate and Solution.

FORM: Crystalline, Powder and 35% Solution

TRADE NAMES/SYNONYMS: Sodium Molybdenum Oxide, Disodium Molybdate, Disodium Molybdate Dihydrate, Sodium Molybdate: Sodium Molybdate Dihydrate, Sodium Molybdate Anhydrous, Sodium Molybdate Solution.

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	RTECS NUMBER	PERCENTAGE
Sodium Molybdate Anhydrous	7631-95-0	QA5075000	100.00 as anhydrous
Sodium Molybdate Solution	7631-95-0	QA5075000	35.00 as anhydrous
Sodium Molybdate Dihydrate	10102-40-6	QA5075000	100.00 as dihydrate

Section 3 - Hazards Identification

NFPA RATINGS (SCALE 0-4): Health = 1 Fire = 0 Reactivity = 0

EMERGENCY OVERVIEW: Odorless, white opaque powder or liquid.

Avoid breathing dust. Avoid contact with eyes, skin and clothing. Keep container closed. Wash after handling. Use adequate ventilation.

POTENTIAL HEALTH EFFECTS

SHORT TERM EFFECTS: Inhalation may cause irritation. May cause skin rash. May irritate eyes. Ingestion may cause vomiting, high blood pressure and coma. Additional effects from inhalation may include chest pain.

LONG TERM EFFECTS: Ingestion may cause diarrhea.

CARCINOGEN STATUS:

OSHA: N

NTP: N

IARC: N

Section 4 - First Aid Measures

INHALATION: FIRST AID - Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Get medical attention.

SKIN CONTACT: FIRST AID - Remove contaminated clothing and shoes. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention.

EYE CONTACT: FIRST AID - Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (approximately 15-20 minutes). Get medical attention.

INGESTION: FIRST AID - If vomiting occurs, keep head lower than hips to prevent aspiration. Get medical attention if needed.

Section 5 - Fire-Fighting Measures

FIRE AND EXPLOSION HAZARD: Negligible fire hazard when exposed to heat or flame.

EXTINGUISHING MEDIA: Extinguish using agent suitable for type of surrounding fire.

FIRE FIGHTING: No acute hazard. Move container from fire area if possible. Avoid breathing vapors or dusts; keep upwind.

FIRE FIGHTING PROTECTIVE EQUIPMENT: Full fire fighting turn-out gear (bunker gear). Any supplied air respirator with full face piece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full face piece.

Section 6 - Accidental Release Measures

OCCUPATIONAL SPILL: Contain liquid or sweep up dry material and place in suitable clean, dry containers for reclamation or later disposal. Do not flush spilled material into sewer. Keep unnecessary people away.

Section 7 - Handling and Storage

STORAGE: Observe all federal, state and local regulations when storing or disposing of this substance.

Section 8 - Exposure Controls / Personal Protection

EXPOSURE LIMITS:

MOLYBDENUM, SOLUBLE COMPOUNDS (AS Mo):

5 mg/m³ OSHA TWA

0.5 mg/m³ ACGIH TWA

5 mg/m³ DFG MAK TWA (total dust)

50 mg/m³ DFG MAK 30 minute peak, average value, 1 time/shift

VENTILATION: Provide local exhaust ventilation system to meet published exposure limits.

EYE PROTECTION: Employee should wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

EMERGENCY EYE WASH: Where there is any possibility that an employee's eyes may be exposed to this substance; the employer should provide an eye wash fountain within the immediate work area for emergency use.

CLOTHING: Employee should wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact with this substance.

GLOVES: Employee should wear appropriate protective gloves to prevent contact with this substance.

RESPIRATOR: The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection. The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

- Any dust, mist and fume respirator.
- Any chemical cartridge respirator with a dust, mist and fume filter.
- Any powered air-purifying respirator with a dust, mist and fume filter.
- Any type 'c' supplied-air respirator with a full face piece operated in pressure-demand or other positive pressure mode or with a full face piece, helmet or hood operated in continuous-flow mode.
- Any self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode.

Section 9 - Physical and Chemical Properties

DESCRIPTION: Odorless, white opaque powder or clear solution.

MOLECULAR WEIGHT: 205.97 (anhydrous), 241.948 (dihydrate)

MOLECULAR: Na₂MoO₄ (anhydrous) Na₂MoO₄ · x 2H₂O (dihydrate)

BOILING POINT of Solution: 105°C

FREEZING POINT of Solution: -4°C (25°F)

MELTING POINT of Anhydrous: 687° C

SPECIFIC GRAVITY of Dihydrate: 3.28

SPECIFIC GRAVITY of Anhydrous: 2.59

Section 10 - Stability and Reactivity

REACTIVITY: Stable under normal temperatures and pressures.

CONDITIONS TO AVOID: May burn but does not ignite readily. Avoid contact with strong oxidizers, excessive heat, sparks or open flame.

INCOMPATIBILITIES: None identified.

HAZARDOUS DECOMPOSITION: Thermal decomposition products may include toxic sodium oxide.

POLYMERIZATION: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

Section 11- Toxicological Information

SODIUM MOLYBDATE:

TOXICITY DATA

ANHYDROUS: >2080 mg/m³/4 hours inhalation-rat LC₅₀; 4000 mg/kg ORAL-RAT LD₅₀; 570 mg/kg subcutaneous-mouse LD₅₀; 917 mg/kg intravenous-cat LD₅₀; 303 mg/kg intraperitoneal-mouse LD₅₀; 576 mg/kg intraperitoneal-rat LD₅₀; mutagenic data (RTECS); reproductive effects data (RTECS).

DIHYDRATE: 520 Mg/Kg Intraperitoneal-rat LD₅₀; 257 mg/kg intraperitoneal-mouse LD₅₀; Reproductive effects data (RTECS).

CARCINOGEN STATUS: None

ACUTE TOXICITY LEVEL: Moderately toxic by ingestion.

TARGET ORGANS: No data available.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Blood system problems, bone, joint or tooth problems, respiratory problems.

MUTAGENIC DATA: Phage inhibition capacity - *Escherichia coli* 16 mmol/L; sex chromosome Loss and non disjunction - *Saccharomyces cerevisiae* 80 mmol/L

REPRODUCTIVE EFFECTS DATA: 16474 ug/kg intratesticular - mouse TDLo 1 day male.

ADDITIONAL DATA: The levels of copper, sulfur and zinc in the diet may have an effect on the toxicity.

HEALTH EFFECTS:

INHALATION

ACUTE EXPOSURE: May cause respiratory tract irritation, coughing and chest discomfort.

CHRONIC EXPOSURE: Chronic exposure of workmen in a molybdenum-copper plant produced liver dysfunction with hyperbilirubinemia. Similar hepatotoxic effects were found in animals given molybdenum salts.

SKIN CONTACT:

ACUTE EXPOSURE: Brief contact with dry skin is unlikely to cause irritation. On wet skin, irritation and a difficult to heal rash may occur. Primary irritation which appeared after 24 hours and cleared up after 72 hours has been reported in animals.

CHRONIC EXPOSURE: Prolonged contact with dry skin may cause irritation. Among chemists handling 4 molybdenum and tungsten solutions, there was a high incidence of gout.

EYE CONTACT

ACUTE EXPOSURE: May cause irritation. A 20% solution applied to animal eyes caused conjunctivitis with discharge, but no irritation to the cornea and iris.

CHRONIC EXPOSURE: No data available.

INGESTION

ACUTE EXPOSURE: Large doses may cause cramping, vomiting and hypertension. With lethal doses of molybdenum compounds, death was preceded by lethargy and coma.

CHRONIC EXPOSURE: Chronic feeding to rabbits at dietary levels of 0.1% or higher was uniformly fatal within a few weeks. There is a correlation between the molybdenum content in food and the incidence of gout, uricemia and xanthine oxidase activity. Signs of molybdenum poisoning include loss of appetite, listlessness, diarrhea and reduced growth rate. Animals on high dietary levels of molybdenum showed anemia and deformities of the joints of the extremities.

Section 12 - Ecological Information

FISH TOXICITY: >79800 ug/L 96 hour LC₅₀ (Mortality) Striped bass (*Morone saxatilis*).

INVERTEBRATE TOXICITY: 2650000 ug/L 96 week EC₅₀ (Immobilization) Amphipod (*Cragonyx pseudogracilis*).

ALGAL TOXICITY: 960000 ug/L 48 week (Cytogenetic) Flagellate euglenoid (*Euglena gracilis*).

OTHER TOXICITY: 960 ug/L 7 day LC₅₀ (Mortality) Narrow mouthed frog (*Microhyla carolinensis*).

Section 13 - Disposal Considerations

WASTE DISPOSAL: Observe all federal, state and local regulations when disposing of this substance.

Section 14 - Transport Information

No classification currently assigned.

Section 15 - Regulatory Information**U.S. REGULATIONS:**

TSCA INVENTORY STATUS Y

TSCA 12 (b) EXPORT NOTIFICATION Not Listed

CERCLA SECTION 103 (40 CFR 302.4) N

SARA SECTION 302 (40 CFR 355.30) N

SARA SECTION 304 (40 CFR 355.40) N

SARA SECTION 313 (40 CFR 372.65) N

OSHA PROCESS SAFETY (29 CFR 1910.119) N

CALIFORNIA PROPOSITION 65 N
SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21):

- ACUTE HAZARD N
- CHRONIC HAZARD N
- FIRE HAZARD N
- REACTIVITY HAZARD N
- SUDDEN RELEASE HAZARD N

STATE REGULATIONS:

California Proposition 65: The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name: None

Section 16 - Other Information

This material safety data sheet and the information it contains is offered to you in good faith as accurate. We have reviewed any information contained in this data sheet which we received from sources outside our company. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents. No warranty is made, either express or implied.