



ammonium molybdate

Chemwatch Material Safety Data Sheet
Issue Date: 6-Apr-2009
X9317SP

Hazard Alert Code: MODERATE

CHEMWATCH 10049-1
Version No:4.1.1.1
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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

ammonium molybdate

SYNONYMS

H₂₄-Mo₇-N₆-O₂₄.4H₂O, (NH₄)₆Mo₇O₂₄.4H₂O, MoO₄.2NH₄, "ammonium molybdate, anhydrous", "diammonium molybdate", "ammonium molybdate (VI) tetrahydrate", tetrahydrate, "molybdic acid, diammonium salt", "ammonium paramolybdate", "ammonium dimolybdate", "diammonium tetraoxomolybdate(2-)", "APS AR00000046"

PRODUCT NUMBERS

21276260

PRODUCT USE

Used in photography and for decorating ceramics. Analytical reagent for detecting and determining phosphates, arsenates, lead.

SUPPLIER

Company: VWR International, Pty Ltd
Address:
Unit 1/31 Archimedes Place
Murarrie, QLD 4172

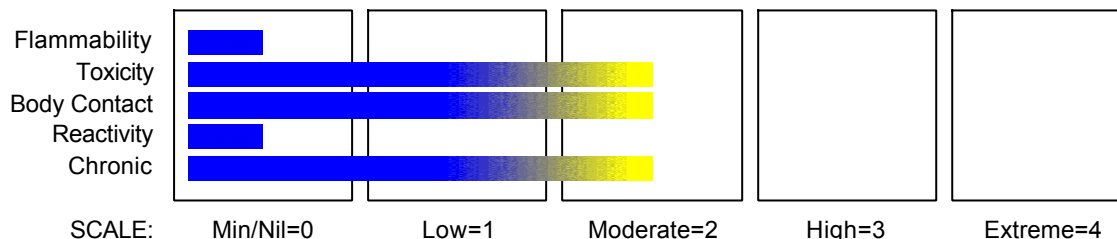
Australia
Telephone: 61 7 3009 4100
Emergency Tel: **61 7 3009 4100 (Monday - Friday 8:30am - 5:00pm; General Information)**
Fax: 61 7 3009 4199

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

CHEMWATCH HAZARD RATINGS



RISK

- Harmful if swallowed.
- Danger of cumulative effects.
- Irritating to eyes, respiratory system and skin.
- May cause SENSITISATION by skin contact.

SAFETY

- Do not breathe dust.
- Avoid contact with skin.
- Avoid contact with eyes.
- Wear suitable protective clothing.

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Section 2 - HAZARDS IDENTIFICATION

- Harmful to aquatic organisms, may cause long- term adverse effects in the aquatic environment.
- Wear suitable gloves.
- Wear eye/face protection.
- To clean the floor and all objects contaminated by this material, use water.
- Keep away from food, drink and animal feeding stuffs.
- In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
- If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ammonium molybdate	13106-76-8	100

Section 4 - FIRST AID MEASURES

SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.

EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

NOTES TO PHYSICIAN

for poisons (where specific treatment regime is absent):

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
 - Watch for signs of respiratory insufficiency and assist ventilation as necessary.
 - Administer oxygen by non-rebreather mask at 10 to 15 L/min.
 - Monitor and treat, where necessary, for pulmonary oedema.
- Treat symptomatically.

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Section 4 - FIRST AID MEASURES

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves in the event of a fire.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.

FIRE/EXPLOSION HAZARD

- Non combustible.
 - Not considered a significant fire risk, however containers may burn.
- Decomposition may produce toxic fumes of: nitrogen oxides (NOx), metal oxides.
May emit poisonous fumes.
May emit corrosive fumes.

FIRE INCOMPATIBILITY

- None known.

HAZCHEM

None

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact with the substance, by using protective equipment.

MAJOR SPILLS

- Moderate hazard.
- CAUTION: Advise personnel in area.
 - Alert Emergency Services and tell them location and nature of hazard.
 - Control personal contact by wearing protective clothing.
 - Prevent, by any means available, spillage from entering drains or water courses.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

SUITABLE CONTAINER

- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

- Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
- These trifluorides are hypergolic oxidisers. They ignites on contact (without external source of heat or ignition) with

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Section 7 - HANDLING AND STORAGE

recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.

- The state of subdivision may affect the results.
- WARNING: Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.
- The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive.
- Avoid reaction with borohydrides or cyanoborohydrides.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

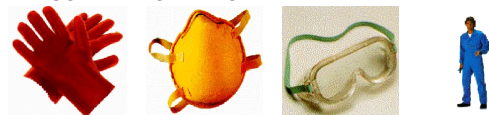
EXPOSURE CONTROLS

MATERIAL DATA

AMMONIUM MOLYBDATE:

An increased incidence of non-specific symptoms including headache, weakness, fatigue, anorexia and joint and muscle weakness has been reported to occur in mining and metallurgy workers exposed to 60-600 mg (as Mo). Some investigators have attributed gout and elevated uric acid concentration found in some Armenians to result from exposures to Armenian soils rich in molybdenum, whilst exposure has been implicated as a cause of bone disease amongst Indians.

PERSONAL PROTECTION



RESPIRATOR

- Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET

■ NOTE:

- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
 - Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.
- The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
- The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:.
- Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.
- polychloroprene.

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

- nitrile rubber.
- butyl rubber.
- fluorocautchouc.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.

ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Colourless, odourless white powder or slightly green yellow crystals; mixes with water. Insoluble in alcohol. Ammonium molybdate based on (MoO₄)⁽²⁻⁾ should not be confused with a similarly called substance (also known as ammonium dimolybdate) based on so-called (and equally confused) molybdic acid (85%).

PHYSICAL PROPERTIES

Solid.

Mixes with water.

State	Divided solid	Molecular Weight	1235.9
Melting Range (°C)	90 (- H ₂ O)	Viscosity	Not Applicable
Boiling Range (°C)	Not available	Solubility in water (g/L)	Miscible
Flash Point (°C)	Not Applicable	pH (1% solution)	5.0- 5.5 (5%)
Decomposition Temp (°C)	190	pH (as supplied)	Not applicable
Autoignition Temp (°C)	Not applicable	Vapour Pressure (kPa)	Not applicable.
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	2.3 - 2.4
Lower Explosive Limit (%)	Not applicable	Relative Vapour Density (air=1)	Not applicable.
Volatile Component (%vol)	Nil @ 38 C.	Evaporation Rate	Not Applicable

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

Molybdenum, an essential trace element, can in large doses hamper growth and cause loss of appetite, listlessness and diarrhoea.

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Section 11 - TOXICOLOGICAL INFORMATION

Anaemia also occurs, and other symptoms include greying of hair, shrinking of the testicles, reduced fertility and milk production, shortness of breath, incoordination and irritation of the mucous membranes. Symptoms of copper deficiency are also seen.

Large doses of ammonia or injected ammonium salts may produce diarrhoea and may be sufficiently absorbed to produce increased production of urine and systemic poisoning. Symptoms include weakening of facial muscle, tremor, anxiety, reduced muscle and limb control.

EYE

- This material can cause eye irritation and damage in some persons.

SKIN

- This material can cause inflammation of the skin on contact in some persons.

The material may accentuate any pre-existing dermatitis condition.

Open cuts, abraded or irritated skin should not be exposed to this material.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

- The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

Bronchial and alveolar exudate are apparent in animals exposed to molybdenum by inhalation. Molybdenum fume may produce bronchial irritation and moderate fatty changes in liver and kidney.

CHRONIC HEALTH EFFECTS

- Substance accumulation, in the human body, is likely and may cause some concern following repeated or long-term occupational exposure.

Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray.

High levels of molybdenum can cause joint problems in the hands and feet with pain and lameness. Molybdenum compounds can also cause liver changes with elevated levels of enzymes and cause over-activity of the thyroid gland. A generalised feeling of unwellness can occur, with tiredness, weakness, diarrhoea, loss of appetite and weight. Molybdenum has been associated with cancers of the airways, but on the other hand, a low intake of molybdenum may cause an increased risk of developing oesophageal cancer.

TOXICITY AND IRRITATION

- Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.

The following information refers to contact allergens as a group and may not be specific to this product.

Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

Section 12 - ECOLOGICAL INFORMATION

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Ecotoxicity

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Section 12 - ECOLOGICAL INFORMATION

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
ammonium molybdate	No Data Available	No Data Available	No Data Available	No Data Available

Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
 - Return to supplier for reuse/ recycling if possible.
- Otherwise:
- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
 - Where possible retain label warnings and MSDS and observe all notices pertaining to the product.
- Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.
- A Hierarchy of Controls seems to be common - the user should investigate:
- Reduction.
 - DO NOT allow wash water from cleaning or process equipment to enter drains.
 - It may be necessary to collect all wash water for treatment before disposal.
 - In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
 - Where in doubt contact the responsible authority.
 - Recycle wherever possible or consult manufacturer for recycling options.
 - Consult State Land Waste Management Authority for disposal.
 - Bury residue in an authorised landfill.
 - Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:

None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, IATA, IMDG

Section 15 - REGULATORY INFORMATION

Indications of Danger:

Xn Harmful

POISONS SCHEDULE

None

REGULATIONS

ammonium molybdate (CAS: 13106-76-8, 12054-85-2) is found on the following regulatory lists;

"Acros Transport Information", "Australia Exposure Standards", "Australia Hazardous Substances Information System - Consolidated Lists", "Australia Inventory of Chemical Substances (AICS)", "Australia National Pollutant Inventory", "OECD List of High Production Volume (HPV) Chemicals", "Sigma-Aldrich Transport Information"

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
ammonium molybdate	13106-76-8, 12054-85-2

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Section 16 - OTHER INFORMATION

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

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This is the end of the MSDS.