



MOLYBDENUM PRODUCTS, INC.

MATERIAL SAFETY DATA SHEET

AMMONIUM HEPTAMOLYBDATE

PRODUCT IDENTIFICATION

Chemical Name: Ammonium Heptamolybdate
Common Name: Ammonium Heptamolybdate
Formula: $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 7\text{H}_2\text{O}$
Synonyms: Ammonium Paramolybdate
Ammonium Molybdate
AHM
CAS No.: 12027-67-7, 12054-85-2
Chemical Family: Soluble Molybdenum Compounds

COMPANY IDENTIFICATION

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COMPOSITION/INGREDIENTS

<u>Component</u>	<u>CAS No.</u>	<u>Percent</u>
Ammonia, NH_3	7664-41-7	8.25
Molybdenum Trioxide, MoO_3	1313-27-5	81.55
Water, H_2O	7732-18-5	10.20

HAZARDS INFORMATION

Hazards of Ammonium Heptamolybdate are related more to the evolution of Ammonia on decomposition than to Molybdenum.

Molybdate salts are safe to handle and use under most ordinary conditions of application. No special precautions are needed beyond those normally employed for any chemical or material of low toxicity.

The U.S. Public Health Service in its Bulletin No. 293 "The Toxicity of Molybdenum" dated 1945 reports that "Molybdenum Compounds in general are of a low order of toxicity both from the point of view of observed clinical effects as well as from the histopathological point of view." The New Drug Institute, after conducting tests, reported in the Food, Drug, Cosmetic Law Journal of October 1955 that, "Sodium Molybdate may be classified as a compound with only mildly irritating mucous membrane properties and no sensitizing properties."

Inhalation may cause respiratory tract irritation and chest discomfort. May involve both reversible and irreversible changes but not severe enough to cause death or permanent injury.

Skin contact may cause some irritation due to the reaction of skin moisture with the Ammonia content. However, 1991 studies on rabbits using Ammonium Dimolybdate showed no Erythema or Oedema after four days exposure.

Eye contact will cause irritation and burning due to the Ammonia content. In 1991 studies using Ammonium Dimolybdate little to no acute or systemic effect was noted in the eyes of test animals.

Ingestion of small amounts presents little or no hazard. Reports exist that correlate the incidence of high uric acid levels and gout to the intake of Molybdenum. The acute median LD₅₀ value using Ammonium Dimolybdate on rats was 3883 mg/kg of bodyweight.

Molybdenum and its compounds are reported to have caused serious health problems in some animals, particularly ruminants where a copper deficiency known as "Molybdenosis" results.

FIRST AID MEASURES

Inhalation: Remove to fresh air. Give oxygen if there is difficulty in breathing. Consult a doctor.

Skin Contact: Wash with soap and water.

Eyes: Flush thoroughly with large amounts of water for at least twenty minutes. Consult a doctor.

Ingestion: Drink several glasses of water. Consult a doctor.

FIRE FIGHTING MEASURES

Ammonium Heptamolybdate is not flammable. It will dissolve in water used to fight any fire. Subjected to the heat of a fire it will decompose to Ammonia, water and Molybdenum Trioxide.

ACCIDENTAL RELEASE MEASURES

Within the plant. Collect the residue for disposal in accordance with any US EPA, state and local regulations. Do not discharge to sewer or natural waters or drainages.

Outside the plant. Follow "within the plant" directions. Ammonium Heptamolybdate is not subject to SARA Title III reporting.

HANDLING AND STORAGE

Store in clean, cool, dry place.

Ammonium Molybdate may be stored in glass, plastic, paper or steel containers.

Observe all Federal, State and local regulations when storing.

EXPOSURE CONTROLS AND PERSONAL PROTECTION

Because Ammonium Heptamolybdate is of a very low order of toxicity special protection is not necessary beyond those normally employed for any chemical or material of low toxicity.

PHYSICAL AND CHEMICAL PROPERTIES

Ammonium Heptamolybdate

Formula Weight:	1235.86
Specific Gravity:	2.276
Melting Point:	Decomposes
Solubility:	Very soluble, 63.5 gm/100 ml at 25°C
Appearance:	White to greenish crystalline powder
Odor:	Slight odor of Ammonia

STABILITY AND REACTIVITY

Ammonium Heptamolybdate is stable at normal temperatures and pressures, but will decompose above 75°C releasing Ammonia.

There is no known incompatibility. Hazardous polymerization will not occur.

TOXICOLOGICAL INFORMATION

Toxicity Data:

Data obtained using Ammonium Heptamolybdate, $(\text{NH}_4)_6\text{Mo}_7\text{O}_{24}\cdot 4\text{H}_2\text{O}$ is not available. Only that obtained using 1) Ammonium Molybdate, $(\text{NH}_4)_2\text{MoO}_4$ and 2) Ammonium Dimolybdate, $(\text{NH}_4)_2\text{Mo}_2\text{O}_7$ is available:

- | | | |
|----|-------------------------|-------------------------|
| 1) | orl-rat LD50:333 mg/kg | scu-rbt LDLo:1600 mg/kg |
| | orl-cat LDLo:1600 mg/kg | orl-gpg LDLo:2200 mg/kg |
| | orl-rbt LDLo:1870 mg/kg | ipr-gpg LDLo:800 mg/kg |
| | scu-gpg LDLo:1380 mg/kg | ipr-rat LDLo:203 mg/kg |
| 2) | orl-rat LD50:3883 mg/kg | |

OSHA PEL: TWA 5 mg (Mo)/m³

ACGIH TLV: TWA 5 mg (Mo)/m³ (Soluble Molybdenum Compounds)

THR: Molybdenum and its compounds are reported by some sources to be poisonous by subcutaneous and intraperitoneal routes and highly toxic based on animal experiments.

Other sources report very low toxicity and despite considerable industrial use of molybdenum itself has yet to be reported.

Some studies suggest that suitable precautions should be taken against the inhalation of considerable amounts of the more soluble molybdenum compounds.

Molybdenum is not stored in the body to any extent because it is rapidly excreted.

Recent studies have shown that molybdenum has importance as a trace element in the normal growth and development of certain forms of plant life. It has been reported in 1993 to be important in humans for enzyme development to reduce "Harn-acid" values and good metabolism. Dietary supplements can be found in most vitamin stores.

ECOLOGICAL INFORMATION

None available

DISPOSAL CONSIDERATION

Do not discharge to sewer or natural waters or drainages. While Ammonium Heptamolybdate is generally considered non-hazardous, disposal must be made in accordance with EPA and/or state and local regulations. Ammonium Heptamolybdate is not a listed hazardous waste.

TRANSPORT INFORMATION

DOT Classification:	None
DOT Identification:	None
DOT Hazard Label:	None
DOT Packaging Requirements:	None

REGULATORY INFORMATION

Not reported in EPA TSCA Inventory

Cercla Section 103 (40CFR302.4):	No
SARA Section 302 (40CFR355.30):	No
SARA Section 304 (40CFR355.40):	No
SARA Section 313 (40CFR372.65):	No
OSHA Process Safety (29CFR1410.119):	No

OTHER INFORMATION

The data in this Material Safety Data Sheet applies only to the specific material noted herein and does not apply to any other materials or combination of materials with this or

any other product. The information provided herein is based on technical data and sources AAA Molybdenum Products believes reliable. AAA Molybdenum Products makes no warranties, expressed or implied, and assumes no responsibility or liability in connection with the use of the material described or the information contained herein.

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This Material Safety Data Sheet is composed in accordance with AAA Molybdenum Products' understanding of ISO 11014 standard for Material Safety Data Sheets.

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