North Metal and Chemical Company

Ammonium Metatungstate
Safety Data Sheet

1. Company Identification and Product Hazard Overview:

Product Name: **Ammonium Metatungstate Hydrate**

Synonyms: **Tungstic Acid; Hexaammonium salt; Ammonium Tungstate; Ammonium Metatungstate hydrate; Ammonium Tungsten Oxide.**

Recommended Use: Used as a raw material for the production of tungsten catalysts for a variety of reactions including oxidation, hydroxylation, hydrogenation, and polymerization.

Manufactured for:

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2. Hazard Identification:

GHS Classification:

Acute Toxicity - Oral (Category 4)
Acute Toxicity - Dermal (Category 5)
Acute Toxicity - Inhalation (Category 4)
Eye Irritation (Category 2B)

Signal Word: Warning
Pictogram:

Hazard Statements:

H303	**:** May be harmful if swallowed
H313	**:** May be harmful in contact with skin
H332	**:** May be harmful inhaled
H320	**:** Causes eye irritation.

Precautionary Statements:
Prevention:

P261 + P271	**:** Avoid breathing dust and/or mist. Use in a well-ventilated area
P264	**:** Wash all affected body parts thoroughly after handling.
P302 + P352	**:** IF ON SKIN: Wash with plenty of water.
P304 + P340	**:** IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P312	: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P338	**:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	: If eye irritation persists: Get medical advice/attention
P312	**:** Call a POISON CENTER/doctor if you feel unwell.
P391 + P501	: Collect Spillage. Dispose of contents/containers in accordance with local regulations

3. Composition/Information on Ingredient:

Common Name: **Ammonium Metatungstate**

CAS Number: **12028-48-7 (also registered under CAS No. 1233-11-8)**

Chemical Formula: **$(NH_4)6H_2W_{12}O_{40}.xH_2O$**

EC Number: **234-733-4**

Substance:	CAS Number:	EC	Compo. (%)
Ammonium Metatungstate	12028-48-7	234-733-4	>99%

4. First Aid Measures:

Eyes : Flush eyes with running water for at least fifteen minutes. Remove any contact lenses. If irritation persists, get medical aid.

Skin : Flush skin with running water for fifteen minutes. If irritation persists, get medical attention.

Ingestion : Rinse mouth out and drink a glass of water. If the product is swallowed, do not induce vomiting.

Inhalation : If safe to do so**,** remove individual from further exposure. Supply fresh air. If cough or other symptoms develop, call doctor/poison center immediately.

PPE first responders : Dust mask, gloves and safety goggles are highly recommended.

5. Fire Fighting Measures:

Fire/Explosion Hazard : Negligible fire hazard when exposed to flame.

Extinguishing Media : Use any extinguishing media suitable for type of surrounding fire.

General Hazard : Evacuate personnel downwind in-order to avoid inhalation of irritating and/or harmful fumes and smoke.

Fire Fighting Procedures: This product is a non-flammable substance. No acute hazard.

Fire Fighting Equipment: Full protective equipment (bunker gear) and self-contained breathing apparatus (SCBA) should be used for all indoor fires and any significant outdoor fires. If possible, firefighters should control run-off water to prevent environmental contamination.

6. Accidental Release Measures:

Personal precautions :Avoid contact with skin and eyes, and formation and accumulation of dust. Ventilate area of spill.

Protective Gear for Personnel : Gloves and dust mask.

Spill Clean-up Procedures : Sweep up and dispose according to state, federal, and local non-hazardous waste laws and regulations. Avoid dust generation.

Environmental Precaution : Do not allow to enter sewers or ground water, or penetrate the soil.

7. Handling and Storage:

Handling : Use appropriate personal protective equipment as specified in Section 8. Handle in a well-ventilated area. Handle in a manner consistent with good industrial/manufacturing techniques and practices. Wash hands thoroughly with soap and water after use. Remove contaminated clothing and protective equipment before entering eating areas.

Storage : Store in a cool, dry well-ventilated area. Keep containers closed when not in use. Observe all federal, state and local regulations when storing or disposing of this substance.

8. Exposure Controls and Personal Protection:

Engineering Controls : Use local exhaust ventilation, which is adequate to limit personnel exposure levels, which do not exceed the OEL. If such equipment is not available, use respirators as specified below.

Personal Protective Equipment : **Eyes and face:** Wear safety glasses with side shields or goggles when handling this material.
Skin: Wear protective clothing and gloves when handling this product to prevent prolonged skin contact.
Respiratory: Avoid breathing dust or mist. Use NIOSH approved respiratory protection equipment when air borne exposure is excessive or exceed the TLV/PEL. The respirator chosen should have a protection factor appropriate for the level of exposure. Under normal circumstances, an air-purifying respirator with dust/fume cartridges should be adequate. Under extreme exposure conditions where concentrations may be above the protection factor of an air-purifying respirator, use a positive-pressure, air-supplied respirator. Appropriate standards for use of respiratory protection (such as 29 CFR 1910.134) should be consulted.

Occupational Exposure Limits for soluble tungsten compounds, as tungsten:

8-Hour Limit Value = 1mg/m^3
Short-Term (15 minute) Limit Value = 3 mg/m^3

Note: The above exposure limits represent ACGIH Threshold Limit Values and NIOSH Recommended Exposure Limits. While these limits have been adopted by several countries, users of this material should consult appropriate national regulations and guidelines on exposure limits.

US OSHA has not established limits for Tungsten.

Derived No Effect Levels (DNEL):

Exposure Pattern	Route	DNEL
Long Term Systemic	Dermal	Workers: 0.63 mg/kg bw/day (0.5 mg W/kg/day) Gen. Pop.: 0.38 mg/kg bw/day (0.3 mg W/kg/day)
Long Term Systemic	Inhalation	Workers: 2.2 mg/m3 (1.6 mg/m3) Gen Pop.: .66 mg/m3 (0.5 mg W/m3)
Long Term Systemic	Oral	Workers: Not applicable Gen Pop.: 0.38 mg/kg/day (0.3 mg W/kg/day)

The most relevant routes of potential exposure to workers would be the dermal and inhalation routes and the relevant routes of exposure for the general population are the oral, dermal, and inhalation routes. Based on the available acute toxicity data (oral, dermal, inhalation), AMT is an acute oral toxicant; however, the derivation of $DNEL_{long\text{-}term}$ will be sufficient to control potential risks associated with the short-term exposures. In addition, AMT was not irritating to either the eyes or the skin and was not sensitizing to the skin in standard tests. Therefore, AMT does not appear to elicit local toxicity effects and deriving DNEL for local effects is not necessary.

Predicted No Effect Concentration (PNEC)
Freshwater aquatic: 0.574 mg dissolved tungsten/L
Marine aquatic: 0.0574 mg dissolved tungsten/L
Intermittent aquatic release: 0.310 mg dissolved tungsten/L
Soil: 2.17 mg tungsten/kg dry soil
Sewage treatment plant: 70 mg tungsten/L

Work Hygienic Practices : Facilities storing or using this material should be equipped with emergency eyewash, and a safety shower. Good personal hygiene practices should always be followed.

9. Chemical and Physical Properties:

Appearance/Color	: White crystalline powder	**Solubility**	: 1635 g/L
Odor	: Odorless	**pH (neat)**	: Not available
Odor threshold	: Not applicable	**Melting Point**	: Not available
Flash Point	: Not applicable	**Freezing Point**	: Not Available
Evaporation Rate	: Not applicable at ambient conditions	**Boiling Range**	: Decomposes starts @ 100°C
Lower Explosive Limit	: Not explosive	**Molecular Weight**	: 2938.41 g/mole
Upper Explosive Limit	: Not explosive	**Flammability**	: Not flammable
Auto-ignition Temp	: Not applicable	**Relative Density**	: Not available
Decomposition Temp	: Not available	**Specific Grav./Density**	: 4 g/cm3
Vapor Pressure	: Not applicable		
Vapor Density	: Not applicable		
Partition Coefficient	: Not applicable		

10. Stability and Reactivity:

Stability : The product is stable under normal ambient conditions of temperature and pressure.

Hazardous Decomposition Products : Decomposes above 300°C to form tungs

Incompatible Materials : None known

Conditions to Avoid : Avoid exposure to extreme temperatures.

11. Toxicological Information:

No data were identified for ammonium Metatungstate other than an acute oral study. Data for similar soluble tungsten compound, sodium tungstate, is provided below as a basis for read-across.

Acute oral
LD50 of female rats was determined to be >1000 mg/kg bw - <1373 mg/kg bw (OECD 401)
Acute Inhalation
4-h aerosol inhalation study of rats (male/female) show LC50 measuring > 5.01 sodium tungstate/L (OECD 403)
Acute dermal
Occlusive coverage of rats (male/female) showed LD50 measuring >2000 mg/kg (OECD 402)
Skin corrosion/irritation
Semi occlusive 4-h coverage of rabbits showed sodium tungstate not to be irritating (OECD 404)
Eye damage/irritation
Study on rabbits (OECD 405) showed sodium tungstate not to be irritating
Respiratory/skin sensitization
In a Guinea pig maximization test (OECD 406), sodium tungstate did not produce evidence of skin sensitization (delayed contact hypersensitivity) in any of the test animals
Germ cell mutagenicity
Sodium tungstate was negative for mutagenicity in an in vitro bacterial reverse mutation assay (OECD 471), an in vitro chromosome aberration assay (OECD 473), an in vitro L5178Y TK +/- Mouse lymphoma Forward Mutation Assay (OECD 476), and in an in vitro micronucleus assay (OECD 474). Based on the lack of mutagenicity reported in in vitro and in vivo assays, sodium tungstate is not considered a mutagen.
Carcinogenicity
No carcinogenicity data available
Reproductive toxicity
Based on the weight-of-evidence from a one-generation reproductive study on sodium tungstate in which no significant effects were observed on reproductive parameters, a lack of significant developmental effects following oral exposure to sodium tungstate, and a lack of reproductive organ effects following 90 days of oral exposure to sodium tungstate it is not expected that sodium tungstate is a reproductive or developmental toxicant.

11. Toxicological Information continued:

STOT - single exposure

No significant systemic effects were observed.

STOT - repeated exposure

A 90-day oral toxicity study similar to OECD 408 was conducted on sodium tungstate on rats in which doses of 125 and 200 mg/kg to male and female Sprague-Dawley rats via oral gavage for 90 consecutive days resulted in pronounced renal changes, specifically mile to severe regeneration of renal cortical tubules. The LOAEL in male and female rats was 125 mg/kg, and the NOAEL in male and female rats was 75 mg/kg based on the mild to severe regeneration of renal cortical tubules observed in the 125 mg/kg/day dose group. The USEPA's Benchmark Dose Software (BMDS, Version 1.4.1) was used to model the data to derive a BMDL10. The lowest (most precautionary) BMDL10 from the renal toxicity endpoint in the 90-day oral toxicity study was 102 mg/kg bw/d.

Aspiration Hazard

AMT is not an expected aspiration hazard

Information on likely routes of exposure

The relevant routes of exposure for the general population are the oral, dermal, and inhalation routes. The most relevant routes of potential exposure to workers would be the dermal and inhalation routes.

Symptoms related to the physical, chemical, and toxicological characteristics

In general, powders or dust may cause mechanical eye and skin irritation. Inhalation of powder or dust may cause mild respiratory tract irritation.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

None known

12. Ecological Information:

No data were identified for ammonium Metatungstate other than an acute oral study. Data for similar soluble tungsten compound, sodium tungstate, is provided below as a basis for read-across

Toxicity to fish

Zebrafish 96-h LC50 > 181 mg sodium tungstate/L (approximately 106 mg W/L) (OECD 203).
Guppy fish 96-h LC50 >3.71 g sodium tungstate/L (approximately 2.06 W/L) (OECD 203).
Zebrafish 38-day flow-through early-life stage/reproduction/ (sub)lethal effects NOEC>=9.8 mg sodium tungstate/L (approximately 5.74 mg W/L) (OECD 210)

Toxicity to invertebrates

Daphnia magna 48-h EC50>163 mg sodium tungstate/L (96 mg tungsten/L) (OECD 202)
Daphnia magna 21-day NOEC based on immobilization >=85.1 mg sodium tungstate/L (approximately 50 mg tungsten/L) (OECD 211)
Daphnia magna 21-day NOEC based on reproduction and growth 44.2 mg sodium tungstate/L (approximately 26 mg tungsten/L) (OECD 211)

Toxicity to algae and plants

Pseudokirchneriella subcapitata (algae) 72-h EC50 based on growth rate >17.7 mg sodium tungstate/L (approximately 10.4 mg W/L) (OECD 201)
Pseudokirchneriella subcapitata (algae) 72-h NOEC based on growth rate 0.81 mg sodium tungstate/L (approximately 0.476 mg W/L) (OECD 201)

Persistence and degradability

Although no data were available for AMT, degradation is not a relevant pathway for this substance as an inorganic metal compound. Persistence is not applicable for this substance as an inorganic substance.

Bioaccumulative potential

Bioaccumulative/Bioconcentration of ammonium Metatungstate is not expected to occur in aquatic or sediment species, as the bioavailability of tungstate (the most common bioavailable form) from tungsten compounds is expected to be at low concentrations in the water column due to stream and river sediment adsorption and low potential for leaching from soils. Furthermore, any uptake mediated by transport proteins would be expected to be internally regulated. The absence of methylated tungsten species also supports the claim that bioaccumulation is not expected to be of concern for ammonium Metatungstate as an inorganic metal compound.

Based on BCFs calculated from paired concentrations of tungsten soil and worm, or soil and plant tissue, ammonium Metatungstate exposures are not expected to result in the bioaccumulation of tungsten in terrestrial organisms.

Mobility in Soil

The adsorption/desorption is highly dependent on the characteristics of the soil system in question. For example, soil sorption coefficients of sodium tungstate are found to increase with decreasing pH. Additionally, soil-tungsten systems may take up to approximately 3-4 months to reach equilibrium. Soil sorption coefficients measured for sodium tungstate ranged from 16.6 to 863 L/kg.

PBT and vPvB assessment

AMT is an inorganic substance, and therefore the PBT vPvB assessment is not applicable.

13. Disposal Considerations:

Disposal Method : Dispose of waste at an appropriate waste disposal facility according to current applicable laws and regulations.

Product Disposal : Recycle or reuse whenever possible. Uncontaminated waste may be returned to the manufacturer. Dispose of any contaminated waste product as non-hazardous waste, unless contamination is hazardous in nature.

Packaging Disposal : Dispose of at a supervised incineration facility or an appropriate waste disposal facility.

14. Transport Information:

Shipping Name : Not D.O.T regulated

Hazard Class : Not Dangerous for Transport

UN Number : Not applicable

15. Regulatory Information:

U.S. Federal Regulations:

TSCA Inventory Status : All components of this product are listed on the TSCA inventory.

TSCA 12b Export Notification : Not listed.

CERCLA Section 103: No

SARA TITLE III (EPCRA) Section 302/304: This product was not found to be on the hazardous chemicals list.

SARA TITLE III (EPCRA) Section 311/312: This product was not found to be on the acute hazard, chronic hazard, fire hazard, or reactivity hazard chemicals lists.

California Proposition 65: This product is not listed.

OSHA process Safety (29CFR1910.119): This product is not listed.

Canadian Domestic Substance List: Not controlled under WHMIS

16. Other Information:

HMIS Rating:*

HEALTH	2
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	D

***HMIS Key:**

HEALTH -2 Can cause irritation or minor reversible injury.
FLAMMABILITY 0- Will not burn
PHYSICAL HAZARD 0—Product stable under ambient temperature and condition.
PERSONAL PROTECTION D —Face shield, gloves, and apron

Revision Date: April 13, 2015

Reasons for Revision : Add necessary data to meet GHS requirements.

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