Safety Data Sheet

1. Identification

1.1. Product identifier

Product Identity	Ammonium Metavanadate (AMV)
Alternate Names	Ammonium Metavanadate (AMV)

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	See Technical Data Sheet.
Application Method	See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name:	U.S. Vanadium, LLC 4285 Malvern Road Hot Springs, Arkansas 71901; U.S.A (Company Identification)
Telephone:	+1-501-262-1270
Fax:	+1-501-262-2793
Website:	

Emergency

24 hour Emergency Telephone No.	NATIONAL RESPONSE CENTER: +1-800-424-8802 CHEMTREC U.S. and CANADA: +1-800-424-9300 CHEMTREC International: +1-202-483-7616 (Collect)

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Acute Tox. 3;H301	Toxic if swallowed.
Acute Tox. 4;H332	Harmful if inhaled.
Eye Irrit. 2;H319	Causes serious eye irritation.
Repr. 2;H361	Suspected of damaging fertility or the unborn child.
STOT RE 1;H372	Causes damage to organs through prolonged or repeated exposure. Specific Target Organs: (Not Available)

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

Signal Word: Danger

Hazard Statements:

H301 Toxic if swallowed.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H361 Suspected of damaging fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.

Precautionary Statements:
[Prevention]:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust / fume / gas / mist / vapors / spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves / eye protection / face protection.

[Response]:

P301+310 IF SWALLOWED: Immediately call a POISON CENTER or doctor / physician.

P304+312 IF INHALED: Call a POISON CENTER or doctor / physician if you feel unwell.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P308+313 IF exposed or concerned: Get medical advice / attention.

P314 Get Medical advice / attention if you feel unwell.

P321 Specific treatment (see information on this label).

P330 Rinse mouth.

P337+313 If eye irritation persists: Get medical advice / attention.

P340 Remove victim to fresh air and keep at rest in a position comfortable for breathing.

[Storage]:

P405 Store locked up.

[Disposal]:

P501 Dispose of contents / container in accordance with local / national regulations.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Vanadic acid, ammonium salt **CAS Number: 0007803-55-6**	**>99%**	**Acute Tox. 3;H301** **Eye Irrit. 2;H319** **Acute Tox. 4;H332** **Repr. 2 (Oral, Developmental Toxin);H361** **STOT RE 1 (Respiratory Tract, Inhalation);H372** **Aquatic Chronic 2;H411**	**[1]**

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.
[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.
*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General In all cases of doubt, or when symptoms persist, seek medical attention.
Never give anything by mouth to an unconscious person.

Inhalation Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Eyes Flush with water 15 minutes to remove particles. See an ophthalmologist.

Skin Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.

Ingestion Give two glasses of water. Induce vomiting if conscious. Call a physician.

4.2. Most important symptoms and effects, both acute and delayed

Overview **Eye Contact:** Irritation with possible corneal injury.
Skin Contact: Irritation with reddening and itching. Absorption of harmful amounts possible.
Inhalation: Irritation of the respiratory tract, chest tightness, wheezing, bloody nose, and coughing.
Ingestion: Abdominal discomfort, nausea, vomiting, cramping. Harmless green tongue discoloration.
EXTREME or repeated overexposure may cause chronic bronchitis, allergic skin reaction, or asthmatic reaction with possible lung injury in susceptible individuals. When exposure ceases, effects are usually reversible.

Inhalation Harmful if inhaled.

Eyes Causes serious eye irritation.

Ingestion Toxic if swallowed.

5. Fire-fighting measures

5.1. Extinguishing media

Not flammable. Use media suitable for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: Decomposes upon heating to ammonia and vanadium pentoxide.

Avoid breathing dust / fume / gas / mist / vapors / spray.

5.3. Advice for fire-fighters

Full protective equipment including positive pressure-breathing apparatus.

Avoid creating dust. Decomposes with heating to ammonia and vanadium pentoxide. Explosive pressures may develop in tight containers. Ammonia may form explosive mixtures with air.

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6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

6.2. Environmental precautions

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

Prevent entering sewage systems or surface water.
Vacuum preferred (or sweeping). Addition of sand or sweeping compound is advisable.
Avoid decontamination procedures which create airborne dusting. Use ventilation if necessary to control dusting.

7. Handling and storage

7.1. Precautions for safe handling

Vacuum dust at point of formation. Provide proper protective gear for handling dusty materials. Personnel should clean up after handling. Avoid areas where dust is present. Avoid heating above 80°C (176°F).
See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities

Keep dry and in closed containers. Avoid heating above 80°C (176°F). Keep away from foodstuffs.

Incompatible materials: Incompatible with aluminum powder. Releases ammonia when exposed to alkaline solutions.

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

No data available.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0007803-55-6	Vanadic acid, ammonium salt	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit

No specific PEL for ammonium metavanadate. Exposure data applies as noted, from DPIM, 10th Edition:

0.05 mg/m^3 for V_2O_5 inhalable particulate matter, measured as vanadium (ACGIH TLV TWA)

0.05 mg V/m^3 for vanadium compounds, 15 minutes (NIOSH REL)

35 mg/m^3 PEL for ammonia from decomposition after heating (OSHA)

Carcinogen Data

CAS No.	Ingredient	Source	Value
0007803-55-6	Vanadic acid, ammonium salt	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory	Use respirators approved by NIOSH/MSHA in dusty areas.
Eyes	Use goggles or safety glasses with side shields.
Skin	Use protective gloves and barrier creams.
Engineering Controls	Proper dust collection. Minimize dust during dumping operations.
Other Work Practices	Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

Appearance	Ivory to Straw-Brown Solid Granules
Odor	No smell
Odor threshold	Not determined
pH	Not Measured
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	Not Measured
Flash Point	Not Measured
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	**Lower Explosive Limit:** Not Measured **Upper Explosive Limit:** Not Measured
Vapor pressure (Pa)	Essentially zero
Vapor Density	Not Measured
Specific Gravity	Not Measured
Solubility in Water	0.5g per 100cc
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Decomposes at 150°C (302°F). Decomposition becomes rapid at 200°C (392°F).
Viscosity (cSt)	Not Measured
Bulk Density	1.2 to 1.3 g/cm3 (75 to 80 lb./ft3)
Oxidizing Properties	May act as a catalyst in certain chemical environments.

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity

Hazardous Polymerization will not occur.

10.2. Chemical stability

Stable under normal circumstances.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Situations which cause dusting or heating above 80°C (176°F).

10.5. Incompatible materials

Incompatible with aluminum powder. Releases ammonia when exposed to alkaline solutions.

10.6. Hazardous decomposition products

Decomposes upon heating to ammonia and vanadium pentoxide.

11. Toxicological information

Acute toxicity

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation LC50, mg/m3/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Vanadic acid, ammonium salt - (7803-55-6)	58.1 mg/kg (rat)	No data available	7.8 mg/m3 (rat)	No data available	No data available

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Classification	Category	Hazard Description
Acute toxicity (oral)	3	Toxic if swallowed.
Acute toxicity (dermal)	---	Not Applicable
Acute toxicity (inhalation)	4	Harmful if inhaled.
Skin corrosion/irritation	---	Not Applicable
Serious eye damage/irritation	2	Causes serious eye irritation.
Respiratory sensitization	---	Not Applicable
Skin sensitization	---	Not Applicable
Germ cell mutagenicity	---	Not Applicable
Carcinogenicity	---	Not Applicable
Reproductive toxicity	2	Suspected of damaging fertility or the unborn child.
STOT-single exposure	---	Not Applicable
STOT-repeated exposure	1	Causes damage to organs through prolonged or repeated exposure.
Aspiration hazard	---	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Vanadic acid, ammonium salt - (7803-55-6)	Not Available	Not Available	Not Available

12.2. Persistence and degradability

Does not readily deteriorate in the environment.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

13. Disposal considerations

13.1. Waste treatment methods

Listed as an acutely hazardous waste when discarded.
U.S. EPA classifies discarded product, non-RCRA empty containers and liners, or spill residue as P119 waste.

14. Transport information

	DOT (Domestic Surface Transportation)	IMO / IMDG (Ocean Transportation)	ICAO/IATA
14.1. UN number	UN2859	UN2859	UN2859
14.2. UN proper shipping name	UN2859, Ammonium metavanadate, 6.1, II	Ammonium metavanadate	Ammonium metavanadate
14.3. Transport hazard class(es)	**DOT Hazard Class:** 6.1	**IMDG:** 6.1 **Sub Class:** Not Applicable	**Air Class:** 6.1
14.4. Packing group	II	II	II

14.5. Environmental hazards

IMDG Marine Pollutant: No

14.6. Special precautions for user

No further information

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

Toxic Substance Control Act (TSCA) All components of this material are either listed or exempt from listing on the TSCA Inventory.

WHMIS Classification D1B

US EPA Tier II Hazards

Fire: No
Sudden Release of Pressure: No
Reactive: No
Immediate (Acute): Yes
Delayed (Chronic): Yes

EPCRA 311/312 Chemicals and RQs (lbs):

Vanadic acid, ammonium salt (1,000.00)

EPCRA 302 Extremely Hazardous:
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 313 Toxic Chemicals:
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Carcinogens (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Developmental Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Female Repro Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Male Repro Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

New Jersey RTK Substances (>1%):

Vanadic acid, ammonium salt

Pennsylvania RTK Substances (>1%):

Vanadic acid, ammonium salt

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H301 Toxic if swallowed.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H361 Suspected of damaging fertility or the unborn child.

H372 Causes damage to organs through prolonged or repeated exposure.

H411 Toxic to aquatic life with long lasting effects.

U.S. Vanadium, LLC believes that the data on this sheet are correct as of the effective date and that the opinions given reflect those of qualified experts. Since U.S. Vanadium, LLC cannot control the product or its use, it is the user's responsibility to use the product safely. The data on this sheet apply only to products sold by corporate subsidiaries of U.S. Vanadium, LLC and may not apply to products sold by others.

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