Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Common Name/Trade Name: Ammonium metavanadate

Manufacturer: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Commercial Name(s): Not available.

Synonym: Ammonium trioxovanadate; Ammonium monovanadate; Ammonium vanadium trioxide

Chemical Name: Vanadic acid, ammonium salt

Chemical Family: Not available.

Chemical Formula: NH4VO3

Supplier: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Catalog Number(s): A1208

CAS#: 7803-55-6

RTECS: YW0875000

TSCA: TSCA 8(b) inventory: Ammonium metavanadate

CI#: Not available.

IN CASE OF EMERGENCY
CHEMTREC (24hr) 800-424-9300
CALL (310) 516-8000

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Ammonium metavanadate</td>
<td>7803-55-6</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients

ORAL (LD50): Acute: 58.1 mg/kg [Rat]. 25 mg/kg [Mouse].
DERMAL (LD50): Acute: 2102 mg/kg [Rat].
DUST (LC50): Acute: 7.8 mg/m³ 4 hours [Rat].

Section 3. Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant). Slightly hazardous in case of skin contact (permeator). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, lungs, liver, upper respiratory tract. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

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### Section 4. First Aid Measures

| **Eye Contact** | Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention. |
| **Skin Contact** | In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention. |
| **Serious Skin Contact** | Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention. |
| **Inhalation** | If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately. |
| **Serious Inhalation** | Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention. |
| **Ingestion** | If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately. |
| **Serious Ingestion** | Not available. |

### Section 5. Fire and Explosion Data

| **Flammability of the Product** | Non-flammable. |
| **Auto-Ignition Temperature** | Not applicable. |
| **Flash Points** | Not applicable. |
| **Flammable Limits** | Not applicable. |
| **Products of Combustion** | Not available. |
| **Fire Hazards in Presence of Various Substances** | Not applicable. |
| **Fire Fighting Media and Instructions** | Not applicable. |
| **Special Remarks on Fire Hazards** | Not available. |
| **Special Remarks on Explosion Hazards** | Not available. |

### Section 6. Accidental Release Measures

| **Small Spill** | Use appropriate tools to put the spilled solid in a convenient waste disposal container. |
| **Large Spill** | Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. |
Section 7. Handling and Storage

Precautions
Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage
Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits
TWA: 0.05 (mg(V2O5)/m³) [Australia]
TWA: 0.05 (mg(V2O5)/m³) [France]
STEL: 0.05 (mg(V2O5)/m³) from NIOSH [United States]
Inhalation
TWA: 0.05 (mg(V2O5)/m³) [United Kingdom (UK)] (dust)
TWA: 0.5 (mg(V2O5)/m³) [United Kingdom (UK)]
Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance
Solid. (Powdered solid. Crystalline powder.)

Molecular Weight
116.98 g/mole

pH (1% soln/water)
Not available.

Boiling Point
Not available.

Melting Point
Decomposition temperature: 200°C (392°F)

Critical Temperature
Not available.

Specific Gravity
2.326 (Water = 1)

Vapor Pressure
Not applicable.

Vapor Density
Not available.

Volatility
Not available.

Odor Threshold
Not available.

Water/Oil Dist. Coeff.
Not available.

Ionicity (in Water)
Not available.

Dispersion Properties
Not available.

Solubility
Partially soluble in hot water.
Very slightly soluble in cold water.
Insoluble in diethyl ether.
Soluble in 165 parts water; more soluble in hot water, and in dilute ammonia.
Solubility in water: 0.52 g/l @ 15 deg. C; 6.95 g/l water @ 96 deg. C.
Insoluble in saturated ammonium chloride solution.
Insoluble in alcohol.
Readily soluble in mono- and diethanolamine.

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### Section 10. Stability and Reactivity Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>The product is stable.</td>
</tr>
<tr>
<td>Instability Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Conditions of Instability</td>
<td>Incompatible materials, dust generation, exposure to moist air or water, excess light</td>
</tr>
<tr>
<td>Incompatibility with various substances</td>
<td>Reactive with oxidizing agents, acids.</td>
</tr>
<tr>
<td>Corrosivity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Special Remarks on Reactivity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Special Remarks on Corrosivity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Polymerization</td>
<td>Will not occur.</td>
</tr>
</tbody>
</table>

### Section 11. Toxicological Information

#### Routes of Entry
- Inhalation
- Ingestion

#### Toxicity to Animals
- Acute oral toxicity (LD50): 25 mg/kg [Mouse].
- Acute dermal toxicity (LD50): 2102 mg/kg [Rat].
- Acute toxicity of the dust (LC50): 7.8 4 hours [Rat].

#### Chronic Effects on Humans
- MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells.
- May cause damage to the following organs: blood, kidneys, lungs, liver, upper respiratory tract.

#### Other Toxic Effects on Humans
- Hazardous in case of skin contact (irritant), of ingestion, of inhalation (lung irritant).
- Slightly hazardous in case of skin contact (permeator).

#### Special Remarks on Toxicity to Animals
- Not available.

#### Special Remarks on Chronic Effects on Humans
- May affect genetic material (mutagenic).
- May cause adverse reproductive effects and birth defects (teratogenic).
- May cause adverse developmental effects based on animal data.

#### Special Remarks on other Toxic Effects on Humans
- Acute Potential Health Effects:
  - Skin: Causes skin irritation. May cause a greenish discoloration of the skin. It may be absorbed by the skin.
  - Eyes: Causes eye irritation. May cause conjunctivitis.
  - Inhalation: Highly Toxic. May be fatal if inhaled. Causes upper respiratory tract (throat) and mucous membrane irritation. Inhalation of vanadium and vanadium compounds may cause sore throat, shortness of breath, labored breathing, coughing, rhinitis, epistaxis, pulmonary edema, green tongue, metallic taste, dry mouth, pharyngitis, diffuse pulmonary fibrosis, bronchitis, tracheitis.
  - Ingestion: Toxic. Harmful if swallowed. Causes gastrointestinal tract irritation. Symptoms may include nausea, vomiting, Abdominal cramping, hypermotility and diarrhea. It may also affect behavior/central nervous system/nervous system (central nervous system depression, headache, tremors, tinnitus, somnolence, coma, convulsions), urinary system (kidneys - proteinuria, erythrocyturia, leukocyturia), blood/bone marrow (thrombocytopenia, bone marrow depression, anemia, neutropenia, basophilic granulation of leukocytes). Vanadium compounds can cause polycythemia, followed by red blood cell destruction, anemia, loss of appetite, pallor, emaciation and may affect the cardiovascular system (arythmias, bradycardia, vasospasm/vasoconstriction of the lungs, spleen, kidneys, and intestines. May also cause a greenish-black tongue discoloration due to deposition of vanadium salts.
  - Chronic Potential Health Effects:
    - Skin: Prolonged or repeated exposure may cause sensitization dermatitis. May produce scattered allergy-like eczematous skin lesions.
    - Inhalation: Prolonged or repeated exposure may cause chronic bronchitis, cough, emphysema, pulmonary edema, green tongue, metallic taste. It may also cause asthma.
    - Ingestion: Prolonged or repeated exposure may cause a greenish tongue, metallic taste. It may also affect the liver, blood (changes in red blood cell count, pigmented or nucleated red blood cells), urinary system/kidneys (acute tubular necrosis).
Section 12. Ecological Information

Ecotoxicity
Not available.

BOD5 and COD
Not available.

Products of Biodegradation
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation
The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation
Not available.

Section 13. Disposal Considerations

Waste Disposal
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information

DOT Classification
CLASS 6.1: Poisonous material.

Identification
UNNA: 2859 : Ammonium Metavanadate  PG: II

Special Provisions for Transport
Not available.

DOT (Pictograms)

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations
New York release reporting list: Ammonium metavanadate
Pennsylvania RTK: Ammonium metavanadate
Massachusetts RTK: Ammonium metavanadate
New Jersey: Ammonium metavanadate
New Jersey spill list: Ammonium metavanadate
Louisiana spill reporting: Ammonium metavanadate
TSCA 8(b) inventory: Ammonium metavanadate
SARA 313 toxic chemical notification and release reporting: Vanadium compounds
CERCLA: Hazardous substances.: Ammonium metavanadate: 1000 lbs. (453.6 kg)

California Proposition 65 Warnings
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

Other Regulations
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances (EINECS No. 232-261-3).
Canada: Listed on Canadian Domestic Substance List (DSL).
China: Not known whether or not it is listed on National Inventory.
Japan: Listed on National Inventory (ENCS).
Korea: Listed on National Inventory (KECI).
Philippines: Listed on National Inventory (PICCS).
Australia: Listed on AICS.

Other Classifications
WHMIS (Canada)  CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS D-2B: Material causing other toxic effects (TOXIC).

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### Ammonium metavanadate

<table>
<thead>
<tr>
<th>Health Hazard</th>
<th>Fire Hazard</th>
<th>Reactivity</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>R23/25- Toxic by inhalation and if swallowed.</td>
<td>R33- Danger of cumulative effects.</td>
<td>R36/37/38- Irritating to eyes, respiratory system and skin.</td>
<td>E</td>
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</tbody>
</table>

- **S26-** In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- **S36/37/39-** Wear suitable protective clothing, gloves and eye/face protection.
- **S45-** In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

#### Protective Equipment

- **Gloves.**
- **Lab coat.**
- **Dust respirator.** Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
- **Splash goggles.**
### Section 16. Other Information

<table>
<thead>
<tr>
<th>MSDS Code</th>
<th>A5140</th>
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</thead>
<tbody>
<tr>
<td>References</td>
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</tr>
<tr>
<td>Other Special Considerations</td>
<td>Not available.</td>
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</tbody>
</table>

Validated by Sonia Owen on 3/21/2014.  
Verified by Sonia Owen.
Printed 3/21/2014.

**CALL (310) 516-8000**

**Notice to Reader**

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.