



Be Right™

# SAFETY DATA SHEET

Issue Date 15-Apr-2019

Revision Date 15-Apr-2019

Version 7.8

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## 1. IDENTIFICATION

### Product identifier

**Product Name** Molybdovanadate Reagent

### Other means of identification

**Product Code(s)** 2076032

**Safety data sheet number** M00297

**UN/ID no** UN2922

### Recommended use of the chemical and restrictions on use

**Recommended Use** Indicator for phosphate.

**Uses advised against** Consumer use.

**Restrictions on use** For Laboratory Use Only.

### Details of the supplier of the safety data sheet

#### **Manufacturer Address**

Hach Company P.O.Box 389 Loveland, CO 80539 USA +1(970) 669-3050

#### **Emergency telephone number**

+1(303) 623-5716 - 24 Hour Service

## 2. HAZARDS IDENTIFICATION

### Classification

#### **Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals	Category 1
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

#### **Hazards not otherwise classified (HNOC)**

Data insufficient for GHS classification but significant enough for mention suggests:

CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER.

Inhalation of low concentrations of sulfuric acid may result in airway irritation such as cough and shortness of breath; high concentrations may result in acute effects such as cough.

### Label elements

#### **Signal word**

Danger

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**Hazard statements**

H290 - May be corrosive to metals  
H314 - Causes severe skin burns and eye damage  
H332 - Harmful if inhaled

**Precautionary statements**

P271 - Use only outdoors or in a well-ventilated area  
P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
P260 - Do not breathe dust/fume/gas/mist/vapors/spray  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting  
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower  
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P310 - Immediately call a POISON CENTER or doctor/physician  
P363 - Wash contaminated clothing before reuse  
P405 - Store locked up  
P501 - Dispose of contents/ container to an approved waste disposal plant  
P234 - Keep only in original container  
P390 - Absorb spillage to prevent material damage

**Other Hazards Known**

Harmful to aquatic life

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**Substance**

Not applicable

**Mixture**

**Chemical Family**

Mixture.

**Chemical nature**

Aqueous solution of inorganic acids and salts.

Percent ranges are used where confidential product information is applicable.

Chemical name	CAS No.	Percent Range	HMRIC #
Sulfuric acid	7664-93-9	40 - 50%	-
Molybdate (Mo7O246-), hexaammonium	12027-67-7	1 - 5%	-
Ammonium sulfate	7783-20-2	1 - 5%	-
Ammonium vanadate	7803-55-6	<1%	-
Potassium persulfate	7727-21-1	<0.1%	-

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.
<b>Inhalation</b>	Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical advice/attention.
<b>Eye contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical advice/attention.
<b>Skin contact</b>	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention.
<b>Ingestion</b>	Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get immediate medical advice/attention.
<b>Self-protection of the first aider</b>	Avoid contact with skin, eyes or clothing. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Avoid breathing vapors or mists.

### Most important symptoms and effects, both acute and delayed

<b>Symptoms</b>	Burning sensation. Coughing and/ or wheezing. Difficulty in breathing.
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### Indication of any immediate medical attention and special treatment needed

<b>Note to physicians</b>	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.
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## 5. FIRE-FIGHTING MEASURES

<b>Suitable Extinguishing Media</b>	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
<b>Unsuitable Extinguishing Media</b>	Caution: Use of water spray when fighting fire may be inefficient.
<b>Specific hazards arising from the chemical</b>	The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.
<b>Hazardous combustion products</b>	Ammonia. Nitrogen oxides. Sulfur oxides.
<b>Special protective equipment for fire-fighters</b>	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

## 6. ACCIDENTAL RELEASE MEASURES

<b>U.S. Notice</b>	Only persons properly qualified to respond to an emergency involving hazardous
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substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

#### Personal precautions, protective equipment and emergency procedures

**Personal precautions** Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Attention! Corrosive material. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Avoid breathing vapors or mists.

**Other Information** Refer to protective measures listed in Sections 7 and 8.

#### Environmental precautions

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

#### Methods and material for containment and cleaning up

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Pick up and transfer to properly labeled containers.

**Prevention of secondary hazards** Clean contaminated objects and areas thoroughly observing environmental regulations.

**Reference to other sections** See section 8 for more information. See section 13 for more information.

## 7. HANDLING AND STORAGE

#### Precautions for safe handling

**Advice on safe handling** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Avoid breathing vapors or mists.

#### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

**Flammability class** Not applicable

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Control parameters

#### Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Sulfuric acid CAS#: 7664-93-9	TWA: 0.2 mg/m <sup>3</sup> thoracic particulate matter	TWA: 1 mg/m <sup>3</sup> (vacated) TWA: 1 mg/m <sup>3</sup>	IDLH: 15 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>
Molybdate (Mo7O246-),	TWA: 0.5 mg/m <sup>3</sup> Mo	TWA: 5 mg/m <sup>3</sup>	IDLH: 1000 mg/m <sup>3</sup> Mo

hexaammonium CAS#: 12027-67-7	respirable particulate matter	(vacated) TWA: 5 mg/m <sup>3</sup>	
Ammonium vanadate CAS#: 7803-55-6	NDF	NDF	Ceiling: 0.05 mg/m <sup>3</sup> V dust and fume 15 min
Potassium persulfate CAS#: 7727-21-1	TWA: 0.1 mg/m <sup>3</sup> persulfate	NDF	NDF

**Appropriate engineering controls**  
**Engineering Controls**

Showers  
 Eyewash stations  
 Ventilation systems.

**Individual protection measures, such as personal protective equipment**

**Respiratory protection**

No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

**Hand Protection**

Wear suitable gloves. Impervious gloves.

**Eye/face protection**

Face protection shield.

**Skin and body protection**

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

**General Hygiene Considerations**

Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace. Wash hands before breaks and immediately after handling the product.

**Environmental exposure controls**

Local authorities should be advised if significant spillages cannot be contained. Do not allow into any sewer, on the ground or into any body of water.

**Thermal hazards**

None under normal processing.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<b>Physical state</b>	Liquid	<b>Color</b>	yellow
<b>Appearance</b>	clear	<b>Odor threshold</b>	Not applicable
<b>Odor</b>	None		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	Not applicable	
pH	< 0.5	
Melting point/freezing point	~ -33 °C / -27.4 °F	
Boiling point / boiling range	~ 109 °C / 228.2 °F	
Evaporation rate	0.06 (water = 1)	
Vapor pressure	21.827 mm Hg / 2.91 kPa at 25 °C / 77 °F	
Vapor density (air = 1)	0.62 (air = 1)	
Specific gravity (water = 1 / air = 1)	1.375	
Partition Coefficient (n-octanol/water)	No data available	

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**Soil Organic Carbon-Water Partition Coefficient** No data available  
**Autoignition temperature** No data available  
**Decomposition temperature** No data available  
**Dynamic viscosity** No data available  
**Kinematic viscosity** No data available

**Solubility(ies)**

**Water solubility**

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

**Solubility in other solvents**

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
Acid	Soluble	> 1000 mg/L	25 °C / 77 °F

**Other Information**

**Metal Corrosivity**

Classified as corrosive to metal according to GHS criteria

**Steel Corrosion Rate**

286.33 mm/yr / 11.27 in/yr

**Aluminum Corrosion Rate**

No data available

**Volatile Organic Compounds (VOC) Content**

<b>Chemical name</b>	<b>CAS No.</b>	<b>Volatile organic compounds (VOC) content</b>	<b>CAA (Clean Air Act)</b>
Sulfuric acid	7664-93-9	No data available	-
Molybdate (Mo7O246-), hexaammonium	12027-67-7	No data available	-
Ammonium sulfate	7783-20-2	No data available	-
Ammonium vanadate	7803-55-6	Not applicable	-
Potassium persulfate	7727-21-1	Not applicable	-

**Explosive properties**

**Upper explosion limit**

No data available

**Lower explosion limit**

No data available

**Flammable properties**

**Flash point**

No data available

**Flammability Limit in Air**

**Upper flammability limit**

No data available

**Lower flammability limit**

No data available

**Oxidizing properties**

No data available.

**Bulk density**

Not applicable

## 10. STABILITY AND REACTIVITY

### Reactivity

Not applicable.

### Chemical stability

Stable under normal conditions.

### Explosion data

**Sensitivity to Mechanical Impact** None.

**Sensitivity to Static Discharge** None.

### Possibility of Hazardous Reactions

None under normal processing.

### Hazardous polymerization

Hazardous polymerization does not occur.

### Conditions to avoid

Exposure to air or moisture over prolonged periods. Excessive heat.

### Incompatible materials

Oxidizing agent. Acids. Bases.

### Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

## 11. TOXICOLOGICAL INFORMATION

### Information on Likely Routes of Exposure

#### Product Information

#### **Inhalation**

Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. Harmful by inhalation.

#### **Eye contact**

Causes burns. Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

#### **Skin contact**

Corrosive. Causes severe burns. Avoid contact with skin and clothing.

#### **Ingestion**

Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways.

#### **Symptoms**

Redness. Burning. May cause blindness. Coughing and/ or wheezing.

### Acute toxicity

Harmful if inhaled

### **Product Acute Toxicity Data**

No data available.

### **Ingredient Acute Toxicity Data**

Test data reported below.

#### Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5%) CAS#: 12027-67-7	Rat LD <sub>50</sub>	333 mg/kg	None reported	None reported	Vendor SDS
Ammonium sulfate (1 - 5%) CAS#: 7783-20-2	Rat LD <sub>50</sub>	2840 mg/kg	None reported	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Ammonium vanadate (<1%) CAS#: 7803-55-6	Rat LD <sub>50</sub>	58.1 mg/kg	None reported	<b>Behavioral</b> Somnolence (general depressed activity) <b>Gastrointestinal</b> Hypermotility Diarrhea <b>Nutritional and Gross Metabolic</b> Body temperature decrease	ChemADVISOR
Potassium persulfate (<0.1%) CAS#: 7727-21-1	Rat LD <sub>50</sub>	802 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)

#### Dermal Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium vanadate (<1%) CAS#: 7803-55-6	Rat LD <sub>50</sub>	2102 mg/kg	None reported	<b>Behavioral</b> Somnolence (general depressed activity) <b>Gastrointestinal</b> Hypermotility Diarrhea <b>Nutritional and Gross Metabolic</b> Body temperature decrease	HSDB (Hazardous Substances Data Bank)

#### Inhalation (Dust/Mist) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium vanadate (<1%) CAS#: 7803-55-6	Rat LC <sub>50</sub>	0.0078 mg/L	4 hours	None reported	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)

#### Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity.

#### Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	6,873.20 mg/kg
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<b>ATEmix (dermal)</b>	No information available
<b>ATEmix (inhalation-dust/mist)</b>	3.57 mg/L
<b>ATEmix (inhalation-vapor)</b>	No information available
<b>ATEmix (inhalation-gas)</b>	No information available

**Skin corrosion/irritation**

Causes severe burns.

**Product Skin Corrosion/Irritation Data**

No data available.

**Ingredient Skin Corrosion/Irritation Data**

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)
Ammonium sulfate (1 - 5%) CAS#: 7783-20-2	Standard Draize Test	Rabbit	800 mg	20 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)

**Serious eye damage/irritation**

Classification based on data available for ingredients. Causes burns. Risk of serious damage to eyes.

**Product Serious Eye Damage/Eye Irritation Data**

No data available.

**Ingredient Eye Damage/Eye Irritation Data**

Test data reported below.

Chemical name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)
Ammonium sulfate (1 - 5%) CAS#: 7783-20-2	Standard Draize Test	Rabbit	0.050 mL	None reported	Not corrosive or irritating to eyes	ECHA (The European Chemicals Agency)

**Respiratory or skin sensitization**

Based on available data, the classification criteria are not met.

**Product Sensitization Data**

No data available.

**Ingredient Sensitization Data**

No data available.

Chemical name	Test method	Species	Results	Key literature references and sources for data
Potassium persulfate (<0.1%) CAS#: 7727-21-1	Local Lymph Node Assay	Mouse	Confirmed to be a skin sensitizer	ECHA (The European Chemicals Agency)

**STOT - single exposure**

Based on available data, the classification criteria are not met.

**Product Specific Target Organ Toxicity Single Exposure Data**

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No data available.

#### Ingredient Specific Target Organ Toxicity Single Exposure Data

Test data reported below.

##### Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium sulfate (1 - 5%) CAS#: 7783-20-2	Man TD <sub>Lo</sub>	1500 mg/kg	None reported	Gastrointestinal Gas	RTECS (Registry of Toxic Effects of Chemical Substances)

##### Inhalation (Vapor) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Human TD <sub>Lo</sub>	0.144 mg/L	5 minutes	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

#### STOT - repeated exposure

Based on available data, the classification criteria are not met.

#### Product Specific Target Organ Toxicity Repeat Dose Data

No data available.

#### Ingredient Specific Target Organ Toxicity Repeat Exposure Data

Test data reported below.

##### Oral Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium vanadate (<1%) CAS#: 7803-55-6	Rat TD <sub>Lo</sub>	4630 mg/kg	90 days	Behavioral Food intake Blood Pigmented or nucleated red blood cells Changes in erythrocyte (RBC) count	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium persulfate (<0.1%) CAS#: 7727-21-1	Rat NOAEL	131.5 mg/kg	28 days	No toxicological effects observed	ECHA (The European Chemicals Agency)

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Potassium persulfate (<0.1%) CAS#: 7727-21-1	Rat NOAEL	91 mg/kg	90 days	No toxicological effects observed	ECHA (The European Chemicals Agency)

##### Inhalation (Dust/Mist) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium vanadate (<1%) CAS#: 7803-55-6	Rat TC <sub>Lo</sub>	4.59 mg/m <sup>3</sup>	4 days	Lungs, Thorax, or Respiration Other changes Immunological Including Allergic Decrease in cellular immune	RTECS (Registry of Toxic Effects of Chemical Substances)

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Potassium persulfate (<0.1%) CAS#: 7727-21-1	Rat NOAEC	10.3 mg/m <sup>3</sup>	90 days	response No toxicological effects observed	ECHA (The European Chemicals Agency)
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#### Inhalation (Vapor) Exposure Route

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Human TC <sub>Lo</sub>	.003 mg/L	168 days	<b>Musculoskeletal</b> Changes in teeth and supporting structures	RTECS (Registry of Toxic Effects of Chemical Substances)

#### Carcinogenicity

Based on available data, the classification criteria are not met.

#### Product Carcinogenicity Data

No data available.

#### Ingredient Carcinogenicity Data

No data available.

Chemical name	CAS No.	ACGIH	IARC	NTP	OSHA
Sulfuric acid	7664-93-9	A2	Group 1	Known	X
Molybdate (Mo7O246-), hexaammonium	12027-67-7	A3	-	-	-
Ammonium sulfate	7783-20-2	-	-	-	-
Ammonium vanadate	7803-55-6	-	-	-	-
Potassium persulfate	7727-21-1	-	-	-	-

#### Legend

<b>ACGIH (American Conference of Governmental Industrial Hygienists)</b>	A2 - Suspected Human Carcinogen A3 - Animal Carcinogen
<b>IARC (International Agency for Research on Cancer)</b>	Group 1 - Carcinogenic to Humans
<b>NTP (National Toxicology Program)</b>	Known - Known Carcinogen
<b>OSHA (Occupational Safety and Health Administration of the US Department of Labor)</b>	X - Present

#### Germ cell mutagenicity

Based on available data, the classification criteria are not met.

#### Product Germ Cell Mutagenicity *invitro* Data

No data available.

#### Ingredient Germ Cell Mutagenicity *invitro* Data

Test data reported below.

Chemical name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	No information available
Ammonium vanadate (<1%) CAS#: 7803-55-6	DNA damage	Human lymphocyte	0.2 mmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Potassium persulfate (<0.1%)	Mutation in microorganisms	<i>Salmonella typhimurium</i>	10 mg/plate	None reported	Negative test result for mutagenicity	ECHA (The European

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CAS#: 7727-21-1						Chemicals Agency)
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**Product Germ Cell Mutagenicity *in vivo* Data**

No data available.

**Ingredient Germ Cell Mutagenicity *in vivo* Data**

Test data reported below.

**Oral Exposure Route**

Chemical name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Ammonium vanadate (<1%) CAS#: 7803-55-6	Micronucleus test	Mouse	50 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

**Reproductive toxicity**

Based on available data, the classification criteria are not met.

**Product Reproductive Toxicity Data**

No data available.

**Ingredient Reproductive Toxicity Data**

Test data reported below.

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Ammonium vanadate (<1%) CAS#: 7803-55-6	Rat	20 mg/kg	70 days	Death Post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants) Female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated) Male fertility index (e.g. # males impregnating females per # males exposed to fertile nonpregnant females)	No information available
Potassium persulfate (<0.1%) CAS#: 7727-21-1	Rat NOAEL	>= 250 mg/kg	Single generation	No reproductive or developmental toxic effects observed	ECHA (The European Chemicals Agency)

**Inhalation (Vapor) Exposure Route**

Chemical name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Rabbit TC <sub>Lo</sub>	.02 mg/L	7 hours	<b>Specific Developmental Abnormalities</b> Musculoskeletal system	No information available

**Aspiration hazard**

Based on available data, the classification criteria are not met.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

Based on available data, the classification criteria are not met.

**Unknown aquatic toxicity**

0% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

**Product Ecological Data**

**Aquatic Acute Toxicity**

No data available.

**Aquatic Chronic Toxicity**

No data available.

**Ingredient Ecological Data**

**Aquatic Acute Toxicity**

Test data reported below.

**Fish**

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5%) CAS#: 12027-67-7	96 hours	<i>Oncorhynchus mykiss</i>	LC <sub>50</sub>	320 mg/L	Vendor SDS
Ammonium sulfate (1 - 5%) CAS#: 7783-20-2	96 hours	<i>Oncorhynchus mykiss</i>	LC <sub>50</sub>	36.7 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Ammonium vanadate (<1%) CAS#: 7803-55-6	96 hours	None reported	LC <sub>50</sub>	2.6 mg/L	EPA (United States Environmental Protection Agency)
Potassium persulfate (<0.1%) CAS#: 7727-21-1	96 hours	None reported	LC <sub>50</sub>	>= 76.3 mg/L	FIFRA

**Crustacea**

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium (1 - 5%) CAS#: 12027-67-7	48 Hours	<i>Daphnia magna</i>	EC <sub>50</sub>	140 mg/L	Vendor SDS
Ammonium sulfate (1 - 5%) CAS#: 7783-20-2	48 Hours	None reported	LC <sub>50</sub>	14 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Potassium persulfate (<0.1%) CAS#: 7727-21-1	48 Hours	<i>Daphnia magna</i>	EC <sub>50</sub>	92 mg/L	EPA (United States Environmental Protection Agency)

**Algae**

Chemical name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Molybdate (Mo7O246-), hexaammonium	72 Hours	<i>Desmodesmus subspicatus</i>	EC <sub>50</sub>	41 mg/L	Vendor SDS

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(1 - 5%) CAS#: 12027-67-7					
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**Aquatic Chronic Toxicity**

No data available.

**Persistence and degradability**

**Product Biodegradability Data**

No data available.

**Bioaccumulation**

**Product Bioaccumulation Data**

No data available.

**Partition Coefficient (n-octanol/water)**

No data available

**Mobility**

**Soil Organic Carbon-Water Partition Coefficient**

No data available

**Other adverse effects**

Contains a substance with an endocrine-disrupting potential.

**13. DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

**Waste from residues/unused products**

Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

**Contaminated packaging**

Do not reuse empty containers.

**US EPA Waste Number**

D002, P119

Chemical name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Ammonium vanadate 7803-55-6	P119	-	-	-

Chemical name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Ammonium vanadate 7803-55-6	-	P119	-	-

**Special instructions for disposal**

Dispose of in accordance with federal, state and local regulations.

**14. TRANSPORT INFORMATION**

**DOT**

**UN/ID no** UN2922  
**Proper shipping name** Corrosive liquids, toxic, n.o.s.  
**DOT Technical Name** Sulfuric acid, Ammonium vanadate  
**Hazard Class** 8  
**Subsidiary class** 6.1  
**Packing Group** II  
**Description** UN2922, Corrosive liquids, toxic, n.o.s. (Sulfuric acid, Ammonium vanadate), 8 (6.1), II  
**Emergency Response Guide Number** 154

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#### TDG

<b>UN/ID no</b>	UN2922
<b>Proper shipping name</b>	Corrosive liquid, toxic, n.o.s.
<b>TDG Technical Name</b>	Sulfuric acid, Ammonium vanadate
<b>Hazard Class</b>	8
<b>Subsidiary class</b>	6.1
<b>Packing Group</b>	II
<b>Description</b>	UN2922, Corrosive liquid, toxic, n.o.s. (Sulfuric acid, Ammonium vanadate), 8 (6.1), II

#### IATA

<b>UN/ID no</b>	UN2922
<b>Proper shipping name</b>	Corrosive liquid, toxic, n.o.s.
<b>IATA Technical Name</b>	Sulfuric acid, Ammonium vanadate
<b>Hazard Class</b>	8
<b>Subsidiary hazard class</b>	6.1
<b>Packing Group</b>	II
<b>ERG Code</b>	8P
<b>Special precautions for user</b>	A3, A803

#### IMDG

<b>UN/ID no</b>	UN2922
<b>Proper shipping name</b>	Corrosive liquid, toxic, n.o.s.
<b>IMDG Technical Name</b>	Sulfuric acid, Ammonium vanadate
<b>Hazard Class</b>	8
<b>Subsidiary hazard class</b>	6.1
<b>Packing Group</b>	II
<b>EmS-No</b>	F-A, S-B
<b>Special precautions for user</b>	274

**Note:** No special precautions necessary.

#### **Additional information**

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods.

If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

## 15. REGULATORY INFORMATION

#### National Inventories

<b>TSCA</b>	Complies
<b>DSL/NDSL</b>	Complies

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

#### International Inventories

<b>EINECS/ELINCS</b>	Complies
<b>ENCS</b>	Complies
<b>IECSC</b>	Complies
<b>KECL</b>	Complies
<b>PICCS</b>	Complies
<b>TCSI</b>	Complies
<b>AICS</b>	Complies
<b>NZIoC</b>	Complies

**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

**ENCS** - Japan Existing and New Chemical Substances

**IECSC** - China Inventory of Existing Chemical Substances

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**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**TCSI** - Taiwan Chemical Substances Inventory  
**AICS** - Australian Inventory of Chemical Substances  
**NZIoC** - New Zealand Inventory of Chemicals

### US Federal Regulations

#### SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical name	SARA 313 - Threshold Values %
Sulfuric acid (CAS #: 7664-93-9)	1.0
Ammonium sulfate (CAS #: 7783-20-2)	1.0
Ammonium vanadate (CAS #: 7803-55-6)	1.0

#### SARA 311/312 Hazard Categories

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	Yes
<b>Fire hazard</b>	No
<b>Sudden release of pressure hazard</b>	No
<b>Reactive Hazard</b>	No

#### CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Sulfuric acid 7664-93-9	1000 lb	-	-	X

#### CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Sulfuric acid 7664-93-9	1000 lb	1000 lb	RQ 1000 lb final RQ RQ 454 kg final RQ
Ammonium vanadate 7803-55-6	1000 lb	-	RQ 1000 lb final RQ RQ 454 kg final RQ

#### U.S. - DEA (Drug Enforcement Administration) List I & List II

Chemical name	U.S. - DEA (Drug Enforcement Administration) - List I or Precursor Chemicals	U.S. - DEA (Drug Enforcement Administration) - List II or Essential Chemicals
Sulfuric acid (40 - 50%) CAS#: 7664-93-9	Not Listed	50 gallon Export Volume (exports, transshipments and international transactions to designated countries)

### US State Regulations

#### California Proposition 65

This product contains the following Proposition 65 chemicals

Chemical name	California Proposition 65
Sulfuric acid (CAS #: 7664-93-9)	Carcinogen



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**WARNING:** This product can expose you to chemicals including Sulfuric acid, which is known to the State of California to cause cancer.

For more information, go to <http://www.P65Warnings.ca.gov>

**IMERC:** Not applicable

**U.S. State Right-to-Know Regulations**

This product may contain substances regulated by state right-to-know regulations.

Chemical name	New Jersey	Massachusetts	Pennsylvania
Sulfuric acid 7664-93-9	X	X	X
Ammonium sulfate 7783-20-2	-	X	X
Ammonium vanadate 7803-55-6	X	X	X
Potassium persulfate 7727-21-1	X	X	X

**U.S. EPA Label Information**

Chemical name	FIFRA	FDA
Sulfuric acid	180.0910	21 CFR 184.1095
Ammonium sulfate	180.0910	21 CFR 184.1143

**16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION**

**Special Comments**

None

**Additional information**

**Global Automotive Declarable Substance List (GADSL)**

Not applicable

**NFPA and HMIS Classifications**

NFPA	Health hazards - 3	Flammability - 0	Instability - 0	Physical and chemical properties -
HMIS	Health hazards - 3	Flammability - 0	Physical hazards - 0	Personal protection - X

**Key or legend to abbreviations and acronyms used in the safety data sheet**

NIOSH IDLH

*Immediately Dangerous to Life or Health*

ACGIH

ACGIH (American Conference of Governmental Industrial Hygienists)

NDF

*no data*

**Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
MAC	Maximum Allowable Concentration	Ceiling	Ceiling Limit Value
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those

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listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.

SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

**Prepared By** Hach Product Compliance Department

**Issue Date** 15-Apr-2019

**Revision Date** 15-Apr-2019

**Revision Note** None

**Disclaimer**

**USER RESPONSIBILITY:** Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

**THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.**

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**End of Safety Data Sheet**