



# MATERIAL SAFETY DATA SHEET

<b>PRODUCT NAME:</b>	Mandelin Reagent	<b>DATE:</b>	May 1, 2012
<b>PRODUCT NUMBER(S):</b>	906 (1006321), 7606 (1006033)		

## SECTION 5 - FIRE FIGHTING MEASURES

**GENERAL HAZARDS:**  
Material is non-flammable, but heated material can generate corrosive vapors and extremely toxic fumes.

**EXTINGUISHING MEDIA:**  
N/A - product is non-flammable.

**FIRE FIGHTING PROCEDURES:**  
Water may be used to dilute and cool product to reduce the risk of toxic and corrosive vapors. Self-contained breathing apparatus is required.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**  
Toxic vanadium and corrosive sulfur oxides fumes and/or vapors may form. Self-contained breathing apparatus and full chemical-resistant turn-out gear is required. Decontamination of fire-fighting gear may be needed.

**HAZARDOUS COMBUSTION PRODUCTS:**  
May produce fumes containing vanadium compounds, which are highly toxic. Self-contained breathing apparatus is required for fire-fighting purposes.

## SECTION 6 - ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**  
AVOID BREATHING VAPORS. Sequester leak or spill. Use sand or kaolin to absorb spill. Do not discharge into waterways or sewer systems. Treat absorbed material as a hazardous heavy metal waste. **DO NOT ADD WATER TO SPILL!!!**

## SECTION 7 - HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:**  
Store in cool, dry, place. Do not store with metals or combustible materials.

## SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

HAZARDOUS COMPONENTS	NIOSH				ACGIH		OSHA	
	TWA ppm	TWA mg/m3	STEL ppm	STEL mg/m3	TLV/TWA ppm	TWA mg/m3	STEL ppm	STEL mg/m3
<b>Ammonium (Meta)Vanadate</b>	<b>OSHA PEL as V2O5 - 0.5 mg/m3 (dust), 0.1 mg/m3 (fumes), ACGIH 0.05 mg/m3 dust or fumes</b>					<b>0.05</b>		<b>0.5/0.1</b>
<b>Sulfuric Acid</b>		<b>1</b>			<b>0.2</b>		<b>1</b>	

## PERSONAL PROTECTION

**RESPIRATORY PROTECTION:**  
Often not needed, as ampoules are small and used immediately. Use approved NIOSH respirator if TLV levels are exceeded. If product is not used immediately, wear a mist respirator.

**PROTECTIVE GLOVES:**  
Always wear protective gloves while working with product.

**EYE PROTECTION:**  
Safety glasses are required to prevent potential eye contact, irritation or injury.

**OTHER PROTECTIVE CLOTHING OR EQUIPMENT:**  
Wear appropriate protective clothing and boots as required to prevent skin contact. For field use, a rubber apron may be worn as additional protection.

**WORK / HYGIENIC PRACTICES:**  
Use good industrial hygiene. Work carefully with ampoules and always wear protective equipment.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

<b>APPEARANCE AND ODOR</b> <b>Yellow liquid and Odorless.</b>	<b>VAPOR PRESSURE</b> <b>Low</b>
pH <b>&lt;1.0</b>	<b>SPECIFIC GRAVITY (WATER = 1)</b> <b>~1.6-1.8 (sulfuric acid)</b>
<b>BOILING POINT / BOILING RANGE</b> <b>N/D</b>	<b>SOLUBILITY IN WATER</b> <b>Complete</b>
<b>FLASH POINT</b> <b>None</b>	<b>VISCOSITY</b> <b>N/D</b>
<b>FLAMMABLE LIMITS</b> LEL: <b>N/D</b> UEL: <b>N/D</b>	<b>VAPOR DENSITY (AIR = 1)</b> <b>~3.4 for sulfuric acid</b>
<b>AUTO-IGNITION TEMPERATURE</b> <b>NE</b>	<b>EVAPORATION RATE (WATER = 1)</b> <b>N/D</b>

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## SECTION 10 - STABILITY AND REACTIVITY

**STABILITY** STABLE X **CONDITIONS TO AVOID:**  
 Extreme Heat (above 120°F), Moisture

**INCOMPATIBILITY (MATERIALS TO AVOID):**  
 Alkalis, metals, halogenated salts (fluorides, chlorides, bromides, iodides, chlorates, perchlorates, etc.), organic compounds, water (will generate heat).

**HAZARDOUS DECOMPOSITION OR BYPRODUCTS:**  
 Vanadium compounds, sulfur compounds

**HAZARDOUS POLYMERIZATION:** Will Not Occur. **CONDITIONS TO AVOID:** None Related to Polymerization.

## SECTION 11 - TOXICOLOGICAL INFORMATION

Hazardous Components	CAS # EINECS #	LD50 of Ingredient (Specify Species and Route)	LC50 of Ingredient (Specify Species)
Ammonium (Meta)Vanadate	7803-55-6	58.1 mg/kg (ORAL, RAT)	7.8 mg/m <sup>3</sup> / 4 Hours (INHALATION, RAT)
	232-261-3		
Sulfuric Acid	7664-93-9	350 mg/kg (ORAL, RAT)	320 mg/m <sup>3</sup> / 2 Hours (INHALATION, MOUSE)
	231-639-5		

## SECTION 12 - ECOLOGICAL INFORMATION

Toxic to aquatic organisms. DO NOT RELEASE PRODUCT INTO ENVIRONMENT!!

## SECTION 13 - DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:**  
 Do not dispose into waterways or sewers. Waste is considered hazardous and must be stored and labeled as such; the user has the responsibility of compliance with federal, state, and local regulations concerning waste disposal. Obey federal, state, and local laws regarding storage of flammable wastes.

## SECTION 14 - TRANSPORT INFORMATION

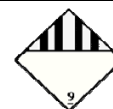
**GROUND SHIPMENT WITHIN USA (DOT):**  
**PROPER SHIPPING NAME:** None - Exempted Qty.  
**CLASS/ PACK GROUP/ LABELING:** Class 8 with Excepted Qty. marking on package. No class 8 label required.  
**NOTES:** When shipped under 49CFR173.4a, This product is exempt from other labeling and waybill requirements.

**GROUND SHIPMENTS TO AND WITHIN CANADA (TDG):**  
**PROPER SHIPPING NAME:** None - Limited Quantity (within Canada), See above for US to Canada  
**CLASS/ PACK GROUP/ LABELING:** Phrase "Ltd. Qty." on package. No additional requirements.  
**NOTES:** TDG only used for shipment within Canada, shipments from the US can follow DOT regulations. See TDG Sections 1.17 & 9.

**AIR SHIPMENTS (ICAO/IATA):**  
**PROPER SHIPPING NAME:** None - (Classified under UN1830 Sulfuric Acid Solution - Excepted Qty. E2)  
**CLASS/ PACK GROUP/ LABELING:** Class 8 with Excepted Qty. marking on package. No class 8 label required.  
**NOTES:** This product is exempt from other labeling and waybill requirements.

**OCEAN SHIPMENTS (IMDG):**  
**PROPER SHIPPING NAME:** None  
**CLASS/ PACK GROUP/ LABELING:** Class 8 with Excepted Qty. marking on package. No class 8 label required.  
**NOTES:** Shipping Paper required with statement "Dangerous Goods in Excepted Quantities" and number of packages.

**ALL SHIPMENTS EXCEEDING EXCEPTED QUANTITY / ALTERNATIVE SHIPPING INFORMATION:**  
**PROPER SHIPPING NAME:** UN 3316, Chemical Kit  
**CLASS/ PACK GROUP/ LABELING:** Class 9, Pack Group III. Miscellaneous Label  
**NOTES:** Full documentation required.



Note: Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 - 177, IMDG, IATA, TDG & UN information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.  
**Information above does not account for overpacks or outer packings with multiple hazardous materials; consult shipper when multiple materials are shipped. Consult regulations for maximum outer packaging and overpack requirements**

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## SECTION 15 - REGULATORY INFORMATION

TSCA (USA - Toxic Substance Control Act):		Yes	
SARA TITLE III (USA - Superfund Amendments and Reauthorization Act):		Yes - 302 and 313 (Sulfuric Acid)	
Acute Health:	Yes	Chronic Health:	Yes
Fire:	No	Sudden Release of Pressure:	No
Reactive:	Yes		

**313 REPORTABLE INGREDIENTS:** Yes Sulfuric Acid and RCRA listed waste as P119

CERCLA (USA - Comprehensive Response Compensation and Liability Act): Yes-Both Components

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986: Yes-Sulfuric acid -(mists) cancer.

State Right to Know: **Sulfuric Acid: MA,NJ,PA.; Ammonium Trioxovanadate (CAS#7803-55-6) MA, NJ, PA.**



CCPR (Canadian Controlled Products Regulations): Yes

CIDL (Canadian Ingredient Disclosure List): Yes

CDSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List): Referenced on CDSL

EINECS (European Inventory of Existing Commercial Chemical Substances): Referenced.


WGK Water Quality Index:

RISK PHRASES:	SYMBOL(S) REQUIRED FOR EU LABEL	SAFETY PHRASES:
<p><b>R39/26/28 : Very toxic: danger of very serious irreversible effects through inhalation and if swallowed.</b></p> <p><b>R35 : Causes severe burns.</b></p> <p><b>R50/53 : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</b></p>	 <b>T+ -TOXIC</b>   <b>C+ - CORROSIVE</b>	<p><b>S1/2 : Keep locked up and out of the reach of children.</b></p> <p><b>S36/37/39 : Wear suitable protective clothing, gloves and eye/face protection.</b></p> <p><b>S45 : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).</b></p> <p><b>S60 : This material and its container must be disposed of as hazardous waste.</b></p> <p><b>S61 : Avoid release to the environment. Refer to special instructions/Safety data sheets.</b></p>

## SECTION 16 - OTHER INFORMATION

<b>Legend</b>			
N/A=Not Applicable		N/E=Not Established	
N/D=Not Determined		N/R=Not Reported	
HMIS HAZARD RATINGS	HEALTH:	<b>4</b>	0 = INSIGNIFICANT
	FLAMMABILITY:	<b>0</b>	1 = SLIGHT
	PHYSICAL HAZARD:	<b>3</b>	2 = MODERATE
	PERSONAL PROTECTIVE EQUIPMENT:	<b>C</b>	3 = HIGH
			4 = EXTREME

REVISION SUMMARY:  
Revised 5/1/2012.

<p><b>MSDS Prepared by:</b> ChemTel Inc. 1305 North Florida Avenue Tampa, Florida USA 33602-2902 Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573 Website: www.chemtelinc.com</p>	
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The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.