



SECTION I	PRODUCT AND COMPANY INFORMATION																					
TRADE NAME:	Sulfuric Acid, Concentrated (98% & 93%) H <sub>2</sub> SO <sub>4</sub>																					
CHEMICAL NAME:	Sulfuric Acid																					
CAS NUMBER:	7664-93-9																					
CHEMICAL FAMILY:	Inorganic Acids																					
SYNONYMS:	Oil of Vitriol, Battery Acid, Sulphuric acid																					
PRIMARY USE:	Used in manufacture of crop nutrients																					
COMPANY INFORMATION:	MOSAIC 8813 U.S. Highway 41 South Riverview, Florida 33569 www.mosaicco.com 306-345-8400, 8 AM to 5 PM Central Time US.																					
EMERGENCY TELEPHONE:	CHEMTREC 1-800-424-9300																					
SECTION II	HAZARD IDENTIFICATION																					
EMERGENCY OVERVIEW :	Health Hazards:	Corrosive. May cause severe burns. Harmful if swallowed. Keep container tightly closed. Use ventilation adequate to keep exposures below recommended limits. Do not breathe mist. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Wash thoroughly after handling. Wear appropriate personal protective equipment.																				
	Physical Hazards:	Highly reactive and capable of igniting finely divided combustible materials on contact. Reacts violently with water and organic materials with evolution of heat. Avoid contact with water.																				
	Physical Form:	Viscous liquid																				
	Appearance:	Colorless to brown, oily liquid																				
	Odor:	Possible sulfur odor																				
	Toxicity:	Toxic																				
	<table border="1" data-bbox="545 1253 933 1493"> <thead> <tr> <th colspan="2">NFPA HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td>Health:</td> <td>3</td> </tr> <tr> <td>Flammability:</td> <td>0</td> </tr> <tr> <td>Instability:</td> <td>2</td> </tr> <tr> <td>Special Hazard:</td> <td>Water Reactive</td> </tr> </tbody> </table>	NFPA HAZARD CLASS		Health:	3	Flammability:	0	Instability:	2	Special Hazard:	Water Reactive	<table border="1" data-bbox="971 1253 1336 1493"> <thead> <tr> <th colspan="2">HMIS HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td>Health:</td> <td>3</td> </tr> <tr> <td>Flammability:</td> <td>0</td> </tr> <tr> <td>Physical Hazard:</td> <td>3</td> </tr> <tr> <td>PPE:</td> <td>Section 8</td> </tr> </tbody> </table>	HMIS HAZARD CLASS		Health:	3	Flammability:	0	Physical Hazard:	3	PPE:	Section 8
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POTENTIAL HEALTH EFFECTS:	<b>Eye:</b>	Corrosive, contact may cause severe irritation, eye burns, and permanent eye damage.																				
	<b>Skin:</b>	Corrosive. Contact may cause severe irritation, skin burns, and permanent skin damage. Inadequate information regarding skin absorption, however, corrosivity of material suggests significant skin absorption will occur																				



	<b>Inhalation (Breathing):</b>	Corrosive and toxic. May be harmful or fatal if inhaled. May cause severe irritation and burns of the nose, throat, and respiratory tract. Excessive irritation of the lungs may cause acute pneumonitis and pulmonary edema, which could be fatal. Chemical pneumonitis and pulmonary edema may result from exposure to the lower respiratory tract and deep lung
	<b>Ingestion (Swallowing)</b>	Corrosive and toxic. Harmful if swallowed. Ingestion may cause severe irritation and burns to the gastrointestinal tract
	<b>Signs and Symptoms:</b>	Effects of overexposure may include severe irritation and burns of the nose and throat and digestive tract, coughing, nausea, vomiting, abdominal pain, chest pain, pneumonitis (inflammation of the lungs)
	<b>Cancer:</b>	The International Agency for Research for Cancer ("IARC") Monographs on the Evaluation of Carcinogen risk to Humans at 106 (Vol. 54, 1992) lists strong inorganic acid mists containing sulfuric acid as a suspected carcinogen. The National Toxicology Program ("NTP") lists strong inorganic acid mists containing sulfuric acid as a known carcinogen in the 9th Report on Carcinogens (9th RoC, May 15,2000). This applies to inorganic acid mists containing sulfuric acid and does not apply to sulfuric acid or sulfuric acid solutions
	<b>Target Organs:</b>	Skin, mucous membranes, gastrointestinal tract, lungs, eyes, teeth
	<b>Developmental:</b>	Inadequate data available
	<b>Other Comments:</b>	None
	<b>Pre-Existing Medical Conditions:</b>	Conditions aggravated by exposure may include skin and respiratory (asthma-like) disorders.
POTENTIAL ENVIRONMENTAL EFFECTS:	Sulfuric acid is toxic to aquatic life at moderate concentrations	
<b>SECTION III</b>	<b>COMPOSITION INFORMATION ON INGREDIENTS</b>	
FORMULA:	H <sub>2</sub> SO <sub>4</sub>	
COMPOSITION:	Sulfuric Acid Water (H <sub>2</sub> O)	93.0 - 98.0% 2.0 – 7.0%
<b>SECTION IV</b>	<b>FIRST AID MEASURES</b>	
FIRST AID PROCEDURES:	Eyes:	Immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately



	Skin:	Immediately flush with plenty of water. Remove contaminated clothing. Discard contaminated clothing properly. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse the affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek immediate medical attention
	Inhaled:	Prompt medical attention is mandatory in all cases of over exposure. Rescue personnel should be equipped with positive pressure self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area, and given assisted (artificial) respiration. If breathing is difficult and medical oxygen and appropriately trained personnel are available, administer 100% oxygen to affected person. Keep victim warm and quiet. Monitor breathing and pulse continuously. Assure that mucous or vomited material does not obstruct the airway by positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.
	Ingestion:	If exposed person is conscious, immediately give milk or water (4-8 ounces) to dilute. Do not induce vomiting. If exposed person loses consciousness, assure airway is open and there is adequate oxygenation. Seek medical attention immediately
NOTE TO PHYSICIAN:	This material is corrosive and may cause acid burns, including gastroesophageal perforation. Late complications of severe acid burns include pulmonary edema, esophageal, gastric or pyloric strictures and stenosis. Following exposure to high concentrations of sulfuric acid, keep patient under medical observation for at least 24 hours.	
<b>SECTION V</b>	<b>FIRE FIGHTING MEASURES</b>	
<b>Flammable Properties:</b>	Flash Point:	Not applicable
	OSHA Flammability Class:	Not applicable
	LEL/UEL:	Not applicable
	Auto-Ignition Temperature:	Not applicable
<b>Extinguishing Media:</b>	<p>Water spray may be used to keep fire-exposed containers cool. Use care because water applied directly to acid results in the evolution of heat and causes splattering.</p> <p>Small fires: Water spray, dry chemical or CO<sub>2</sub>.</p> <p>Large fires: Water spray, dry chemical or CO<sub>2</sub>.</p>	



<b>Protection of Firefighters:</b>	<p>Sulfuric acid is a strong oxidant and in contact with some organic materials may cause fires and explosions. Sulfuric acid will react with water or steam, and may generate hydrogen gas when in contact with some metals.</p>
<b>SECTION VI</b>	<b>ACCIDENTAL RELEASE MEASURES</b>
<b>RESPONSE TECHNIQUES:</b>	<ul style="list-style-type: none"> <li>• Evacuate all personnel from affected area. <u>Note:</u> sulfuric acid is extremely slippery.</li> <li>• Keep combustibles (wood, paper, oil) away from spilled material.</li> <li>• Do not add water to spilled material.</li> <li>• Notify persons downwind of spill / release. Keep area isolated until gas has dispersed.</li> <li>• For a small spill, isolate immediate hazard area for at least 200 feet (60 m) in all directions and keep unauthorized personnel out.</li> <li>• For a large spill, isolate immediate hazard area for at least 1,000 feet (330m) in all directions and keep unauthorized personnel out. Protect persons downwind for 1.5 mile (2.5 km) during daytime; 4 miles (6.5 km) night.</li> <li>• Stay upwind and away from spill / release.</li> <li>• Avoid skin contact and do not inhale gas or mist.</li> <li>• Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8).</li> <li>• Collect as much of the spilled material as possible in acid-resistant containers for possible reuse or proper disposal. Absorb the remaining material with sand, vermiculite, or other absorbent material, or neutralize with soda ash, sodium bicarbonate, limestone, or lime, until acidity is neutralized.</li> <li>• For a release or spill of sulfuric acid into water, neutralize with agricultural lime (slaked lime), crushed limestone, or sodium bicarbonate. Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates.</li> <li>• Prevent spilled material from entering sewers, storm drains, other unauthorized confined treatment drainage systems. Dike far ahead of spill for later recovery or disposal.</li> <li>• Notify appropriate federal, state, and local agencies as may be required (see Section XV).</li> </ul>
<b>SECTION VII</b>	<b>HANDLING AND STORAGE</b>
<b>HANDLING:</b>	<p>Do not enter confined spaces such as tanks or pits without following proper entry procedures such as OSHA 29CFR1910.146 or ANSI Z117.1 (for confined space). The use of appropriate respiratory protection is required when concentrations exceed any established exposure limits (see Section 8). Wash thoroughly after handling. Do not wear contaminated clothing or shoes. Separate from carbides, chlorates, fulminates, nitrates, picrates, powdered metals and combustible materials. Keep away from strong oxidizing agents including oxygen and chlorine. This product has a great affinity for water, extracting it from the air and also from many organic substances; hence it will char wood, etc. When diluting, the acid should be added to the water.</p>



STORAGE:	Store in suitable containers in cool, dry, well-ventilated areas. Materials in storage should be segregated by the hazards they pose. Use "first in –first out" inventory system to prevent full containers being stored for excessive periods of time. Keep container(s) tightly closed. Keep away from any incompatible material. Protect container(s) against physical damage and exposure to water. Sulfuric acid is highly corrosive to most metals, especially when dilute. To prevent ignition of hydrogen gas generated in metal containers (from metal contact), smoking, open flames, and sparks must not be permitted in storage areas. As a precaution, post signs in storage area that say, "No Smoking or Open Flames."	
<b>SECTION VIII</b>	<b>EXPOSURE CONTROLS / PERSONAL PROTECTION</b>	
ENGINEERING CONTROLS:	Eye wash and shower stations should be available in areas where acid is being handled. Use process enclosure, general ventilation, or local exhaust systems, where necessary, to maintain airborne concentrations below the exposure limits.	
PERSONAL PROTECTIVE EQUIPMENT (PPE):	Eye/Face:	Wear splash goggles while handling sealed cylinders. Wear a facemask that provides both splash and impact protection for face and eyes when using respiratory protection described above.
	Skin:	Follow NIOSH recommendations for appropriate gloves that prevent skin contact to sulfuric acid. Depending on conditions of use, an apron and/or arm covers may be necessary.
	Respiratory:	NIOSH recommends that a full-face air-purifying respirator with a high efficiency particulate (HEPA) filter be used under conditions where airborne concentrations are expected to exceed exposure limits (see exposure guidelines below). Use a positive pressure air-supplied respirator and SCBA if there is potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
	Other:	A source of clean water should be available in the work area for flushing eyes and skin. Appropriate chemical protective clothing should be worn as needed.
GENERAL HYGIENE CONSIDERATIONS:	Wash thoroughly after handling. Maintain proper hygiene practices when handling this product.	
EXPOSURE GUIDELINES:	OSHA Permissible Exposure Limits (PEL):	1 mg/m <sup>3</sup>
	ACGIH Threshold Limit Value (TLV):	1 mg/m <sup>3</sup>



SECTION IX	PHYSICAL AND CHEMICAL PROPERTIES
Note: Unless otherwise stated, values in this section are determined at 20°C (68°F) and 760 mm Hg (1 atm).	
Flash Point:	Not applicable
Flammability/ Explosive Limits (%):	Not applicable
Auto-Ignition Temperature:	Not applicable
Appearance:	Dense, oily liquid; colorless to amber depending on purity
Physical State:	Oily liquid
Odor:	Possible sulfur odor
Molecular Weight of Pure Material:	98.08
pH:	0 – 2.1 (4.9 – 0.05% solution concentrations)
Vapor Pressure (mm Hg):	0.001 mmHg
Vapor Density (air=1):	3.4; heavier than air
Boiling Point:	621-635°F / 327-335 °C for a 98% solution
Freezing/Melting Point:	Freezing/Melting: 50°F / 10°C for a 100% solution
Solubility in Water:	Complete
Specific Gravity:	1.84 for a 100% solution
Volatility:	Low volatility
Bulk Density:	15.3 lbs./gal (@60°F)
SECTION X	STABILITY AND REACTIVITY
Chemical Stability:	Stable under proper conditions of storage and handling. Corrosive to metal. Can react with common metals, generating hydrogen gas. Water reactive. Contact with water can generate heat.
Conditions to Avoid:	Very powerful acidic oxidizer, which can ignite or explode in contact with many materials. Water reactive material, generating heat upon contact. Heat will increase overall reactivity and ignition may occur if the mixture is not cooled.
Incompatible Materials:	Highly reactive and capable of igniting finely divided (powder) combustible materials on contact. Extremely hazardous in contact with many materials, particularly carbides, chlorates, fulminates, nitrates, picrates, powdered metals and other combustible materials. Contact with hypochlorites, sulfides, or cyanides will produce toxic gases. Reacts violently with water, alkaline materials or organic materials, with evolution of heat. Corrosive to metal. Attacks many metals, releasing hydrogen gas.
Hazardous Decomposition Products:	Toxic fumes of sulfur. Will react with water or steam to produce toxic and corrosive fumes
Corrosiveness:	Corrosive to metal. Reacts with many metals releasing hydrogen gas.
Hazardous Polymerization:	Will not occur.



SECTION XI	TOXICOLOGICAL INFORMATION
Acute Inhalation Toxicity	LD <sub>50</sub> (rat oral): 2,140 mg/kg
Acute Dermal Toxicity	LC <sub>50</sub> (rat) = 347-420 ppm.
Mutagenesis	No evidence for mutagenicity
Target Organ	Skin, mucous membranes, gastrointestinal tract, lungs, eyes, teeth
Developmental Toxicity	NOEL (maternal) (mouse, rabbit): 5mg/m <sup>3</sup>
Carcinogenicity	The International Agency for Research for Cancer ("IARC") Monographs on the Evaluation of Carcinogen risk to Humans at 106 (Vol. 54, 1992) lists strong inorganic acid mists containing sulfuric acid as a suspected carcinogen. The National Toxicology Program ("NTP") lists strong inorganic acid mists containing sulfuric acid as a known carcinogen in the 9th Report on Carcinogens (9th RoC, May 15,2000). This applies to inorganic acid mists containing sulfuric acid and does not apply to sulfuric acid or sulfuric acid solutions
SECTION XII	ECOLOGICAL INFORMATION
ECOTOXICOLOGY:	LC <sub>50</sub> (bluegill)=pH 3.0-3.84 LC <sub>50</sub> (rainbow trout)=pH 3.7-4.41 LC <sub>50</sub> (zebra fish)=500 mg/L (pH 2.29) LC <sub>50</sub> (mosquito fish)=42mg/L (pH 3.37) EC <sub>50</sub> (Daphnia magna)=29 mg/L (pH 3.5) EC <sub>100</sub> (diatom)=88 mg/L (pH 3.05)
SECTION XIII	DISPOSAL CONSIDERATIONS
	<p>Sulfuric acid, if classified as a waste, would be a RCRA "characteristic" hazardous waste due to the characteristic of corrosivity (D002). If the undiluted material is spilled to soil or water, toxicity characteristic testing of the contaminated materials is recommended to characterize for treatment and/or disposal. Further, this waste may be subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.</p> <p>Container contents should be completely used and containers should be emptied prior to discarding. Unless recycled or used as product, container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.</p>
SECTION XIV	TRANSPORTATION INFORMATION
Regulatory Status	Regulated by US DOT
Proper Shipping Name	Sulfuric Acid

Status: New  
 Section(s) Revised: N/A

Issue Date: May 5, 2006  
 MSDS #: MOS 76640506.1



Hazard Class	8
Packing Group	II
Identification Number	UN 1830
Guide Number	137
<b>SECTION XV</b>	<b>REGULATORY INFORMATION</b>
CERCLA:	Designated as an extremely hazardous substance (EHS) (40 CFR 302). Reportable Quantity (RQ) is 1,000 lb. Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately when there is a release in an amount equal to or greater than the RQ. Toll free (800) 424-8802 or Washington D.C. metropolitan area (202) 426-2675.
RCRA 261.33:	Sulfuric acid that is designated a waste would be a RCRA hazardous waste due to the characteristic of corrosivity (D002). If the sulfuric acid is spilled to soil, water, or other materials, testing for toxicity characteristic parameters is recommended to characterize waste if needed beyond generator knowledge. Further, this waste is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements. Container rinsewater could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations.
SARA TITLE III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or for quantities of less than 10,000 pounds on-site.)	SARA – 311/312: Acute: Yes; Chronic: Yes; Fire: No; Pressure: No; Reactivity: Yes; EHS: Yes SARA – 313: Listed SARA – 302/304: Threshold Planning Quantity (TPQ) = 1,000 lbs, RQ = 1,000 lbs, this chemical is classified as an EHS. (See CERCLA, above)
NTP, IARC, OSHA:	The International Agency for Research on Cancer (IARC) classified “strong inorganic acid mists containing sulfuric acid” as a Category I carcinogen (known human carcinogen). NTP has classified strong inorganic acid mists containing sulfuric acid as a known human carcinogen.
Canada DSL and NDSL:	Sulfuric acid is listed on the DSL NDSL: No
TSCA:	Sulfuric acid is listed on the Section 8(b) TSCA inventory.
CA Proposition 65: (Health & Safety Code Section 25249.5)	This product contains substances that are known to the state of California to cause cancer and/or reproductive harm.
WHMIS:	This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR. Sulfuric acid meets the Canadian WHMIS criteria for class(es): <b>DIA</b> – Poisonous and infection material – Immediate and serious effects – Very toxic <b>DZA</b> – Poisonous and infection material – Other effects – Very toxic <b>E</b> - Corrosive material
CBSA:	This product does not contain any bovine, ruminant or other animal by-products



SECTION XVI	OTHER INFORMATION
Disclaimer:	The information in this document is believed to be correct as of the date issued. <b>HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.</b> This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof. The conditions the use of this product are beyond the control of Mosaic, and Mosaic disclaims any liability for loss or damage incurred in connection with the use or misuse of this substance.
Preparation:	The preparation of this MSDS was in accordance with ANSI Z400.1-2004.
Note to _____ (if applicable):	Not applicable