Certified to NSF/ANSI 60
Max. Use: 50 mg/L

SAFETY DATA SHEET

SECTION 1	PRODUCT AND COMPANY IDENTIFICATION
Trade Name:	Sulfuric Acid, Concentrated (98% & 93%) H_2SO_4
Chemical Name:	Sulfuric Acid
CAS Number:	7664-93-9
Chemical Family:	Inorganic Acids
Synonyms:	Oil of Vitriol Battery Acid Sulphuric Acid
Primary Use:	Use in the manufacture of crop nutrients & water treatment
Company Information:	THE MOSAIC COMPANY 3033 Campus Drive Plymouth, MN 55441 www.mosaicco.com 800-918-8270 or 763-577-2700 8 AM to 5 PM Central Time US
Emergency Telephone:	**EMERGENCY OVERVIEW** **24 Hour Emergency Telephone Number:** **For Chemical Emergencies:** **Spill, Leak, Fire or Accident** **Call CHEMTREC** **North America: (800) 424-9300 (reference CCN201871)** **Others: (703) 527-3887 (collect)**

SECTION 2	HAZARD IDENTIFICATION	
GHS Classification:	Skin Corrosion 1B Serious Eye Damage 1	Hazard Statement H314 Hazard Statement H318
	**Signal Word: DANGER** **Hazard Statement(s)** H314: Causes severe skin burns and eye damage H318: Causes serious eye damage	
Label Elements:		
Prevention:	P260: Do not breathe dusts or mists. P264: Wash thoroughly after handling. P280: Wear protective gloves/protective clothing/eye protection/face protection.	
Response:	P301+ P330+ P331	If SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P303+ P361+ P353	IF ON SKIN: Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P304+ P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	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 doctor.
	P321	Specific treatment, see supplemental first aid information.
	P363	Wash contaminated clothing before reuse.
Storage:	P405	Store locked up.
Disposal:	P501	Disposal of content/containers to be in accordance with local/regional/national regulations.

SECTION 3	COMPOSITION INFORMATION ON INGREDIENTS			
Formula:	H_2SO_4			
Composition:	Sulfuric Acid Water	CAS 7664-93-9 CAS 7789-20-0	93-98% 2.0-7.0%	Skin Corrosion 1B Serious Eye Damage 1

SECTION 4	FIRST AID MEASURES	
First Aid Procedures:	Eyes:	Flush eyes with plenty of clean water for at least 15 minutes. If symptoms persist, seek medical attention.
	Skin:	Wash contaminated area thoroughly with mild soap and water. If chemical or solution soaks through clothing, remove clothing and wash contaminated skin. If irritation develops and persists after washing, seek medical attention.
	Inhaled:	Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. Observe for possible delayed reaction. Get Medical Attention.
	Ingestion:	If swallowed, call a poison control center or physician immediately. Do not induce vomiting unless directed to do so by a poison control center or physician. Never give anything by mouth to an unconscious person.
Note to Physician:	This material is corrosive and may cause acid burns, including gastro esophageal perforation. Late complications of severe acid burns include pulmonary edema, esophageal, gastric or pyloric strictures and stenosis. Following exposure to high concentrations keep patient under medical observation for at least 24 hours.	

SECTION 5	FIRE FIGHTING MEASURES
Extinguishing Media:	Use extinguishing agent suitable for type of surrounding fire. Avoid excessive water to minimize runoff. Prevent firefighter water from entering the environment. 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. When material is not involved in a fire, do not use water on the material. Small fires: Dry chemical or CO_2 Large fires: Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

Protection of Firefighters:	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.

SECTION 6	ACCIDENTAL RELEASE MEASURES
Personal Precautions, PPE and Emergency Procedures:	Use personal protective equipment recommended in Section 8, including respiratory protection as conditions warrant. Avoid skin contact and do not inhale gas or mist. Stay upwind and away from spill/release. Evacuate all personnel from affected area. See DOT Emergency Response Guide 137.
Environmental Precautions:	Prevent spilled material from entering sewers, storm drains or other unauthorized confined treatment drainage systems. Do not add water to spilled material. Dike far ahead of spill for later recovery and disposal. If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the U.S., contact the US Coast Guard national response center toll free number 800-424-8802.
Methods and Materials for Containment and Cleaning up:	Collect as much of the spilled material as possible in acid-resistant containers for possible re-use 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. For a release or spill of sulfuric acid into water, neutralize with agricultural lime (slaked lime), crushed limestone, or sodium bicarbonate.

SECTION 7	HANDLING AND STORAGE
Handling:	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.
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.”

SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION

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:	A NIOSH approved air purifying respirator with a type acid gas filter may be used under conditions where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for 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 if workplace conditions warrant a respirator.
	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):	TWA 1 mg/m^3
	ACGIH Threshold Limit Value (TLV):	TWA 0.2 mg/m^3 (inorganic acid mist)

SECTION 9 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).

Appearance:	Dense, oily liquid; colorless to amber depending on purity	Vapor Pressure (mm Hg):	0.001 mmHg
Odor:	Possible sulfur odor	Vapor Density (air=1):	3.4; heavier than air
Odor Threshold:	No data available	Specific Gravity or Relative Density:	1.84 for a 100% solution
Physical state:	Oily Liquid	Bulk Density:	15.3 lbs./gal (@60oF)
pH:	0 – 2.1 (4.9 - 0.05% solution concentrations)	Solubility in Water:	Complete
Melting Point/ Freezing Point:	Not applicable	Partition coefficient:	No data available

Boiling Point:	621-635ºF / 327-335ºC for a 98% solution	Auto-Ignition Temperature:	Not applicable
Flash Point:	Not applicable	Decomposition Temperature:	Not applicable
Evaporation Rate:	No data available	Viscosity:	No data available
Flammability:	Not applicable	Volatility:	Low volatility
Upper/lower Flammability or explosive limits	Not applicable		

SECTION 10	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 if 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 hypochlorite, sulfide, or cyanide 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:	May be corrosive to iron and mild steels, aluminum, zinc and copper.
Hazardous Polymerization:	Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
Substance:	Sulfuric Acid
Acute Oral Toxicity:	LD_{50} (rat, oral) > 2140 mg/kg
Acute Inhalation Toxicity:	No data available
Acute Dermal Toxicity:	LD_{50} (rat, dermal) > 347-420 ppm
Mutagenesis:	Not classified
Target Organ:	Skin, mucous membranes, gastrointestinal tract, lungs, eyes and teeth
Developmental Toxicity:	NOEL (maternal) (mouse, rabbit): 5mg/m3
Carcinogenicity:	Strong inorganic acid mists containing sulfuric acid: PROVEN (Human, Group 1, IARC) SUSPECTED (Human, Group A2, ACGIH); Group X (NTP)

Certified to NSF/ANSI 60
Max. Use: 50 mg/L

SECTION 12	ECOLOGICAL INFORMATION
Ecotoxicology:	LC50 (bluegill)=pH 3.0-3.84 LC50 (rainbow trout)=pH 3.7-4.41 LC50 (zebra fish)=500 mg/L (pH 2.29) LC50 (mosquito fish)=42mg/L (pH 3.37) EC50 (daphnia magna)=29 mg/L (pH 3.5) EC100 (diatom)=88 mg/L (pH 3.05)

SECTION 13	DISPOSAL CONSIDERATIONS
	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. 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.

SECTION 14	TRANSPORT INFO
Regulatory Status:	Regulated by US DOT, Canada TDG, IATA, IMO/IMDG
Identification Number:	UN1830
Hazard Class:	Class 8 (Corrosive)
Proper Shipping Name	Sulfuric Acid/Sulphuric Acid
Packing Group	II
DOT Emergency Response Guide Number:	137
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	Pollution Category: Y Hazard: S/P Ship type: 3
MARPOL Annex V:	Non-HME

Certified to NSF/ANSI 60
Max. Use: 50 mg/L

SECTION 15	REGULATORY INFORMATION
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.
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 rinseate 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.)	Section 302/304: Not listed		RQ: 1000 lbs		TPQ: 1000 lbs
	Section 311/312:				
	Acute: Yes	Chronic: Yes	Fire: No	Pressure: No	Reactivity: No
	Section 313: Listed				
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:	DSL: Yes NDSL: Not listed				
TSCA:	Listed on the TSCA Inventory				
CA Proposition 65: (Health & Safety Code Section 25249.5)	⚠ WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov				
WHMIS:	**WHMIS 2015** This SDS has been prepared according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.				

SECTION 16	OTHER INFORMATION
Disclaimer:	The information in this document is believed to be correct as of the date issued. **HOWEVER, MOSAIC MAKES NO GUARANTEE, REPRESENTATION, OR WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE 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 THE USE OF THIS PRODUCT.** User is responsible for determining whether this product is fit for a particular purpose and suitable for user's method of use or application and assumes the risk of use thereof. The conditions and 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 product. Each user should review the recommended industrial hygiene and safe handling procedures in the specific context of the intended use and determine whether they are appropriate.
Preparation:	The preparation of this SDS was in accordance with ANSI Z400.1-2010.
Revision Date:	February 6, 2020
Sections Revised:	Header updated to include NSF
SDS Number:	MOS 200005
References:	Globally Harmonized System of Classification and Labelling of Chemicals (GHS) – 4th Edition 2011 OSHA Hazard Communication Standard, 2012 MARPOL Annex V; The Fertilizer Institute (TFI), 2003; TOXNET

Other Hazard Classifications:

NFPA HAZARD CLASS	
Health:	**3**
Flammability:	**0**
Instability:	**2**
Special Hazard:	Water Reactive

HMIS HAZARD CLASS	
Health:	**3**
Flammability:	**0**
Physical Hazard:	**3**
PPE:	Section 8

WHMIS 2015 (HPR) HAZARD CLASS	
Signal Word	Danger
Symbol	
Classification	Skin Corrosion 1B Serious Eye Damage 1
Hazard Statements	H314: Causes severe skin burns and eye damage H318: Causes serious eye damage