Sulfuric Acid (93-99%)

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulfuric Acid (93-99%)

MSDS Number: 10010

Synonyms: H2SO4
Oil of vitriol

Manufacturer/Supplier: Betterbilt Chemical
3430 Union Pacific Ave
Los Angeles, CA 90023

Emergency Health and Safety Number: Chemtrec: 800-424-9300 (24 Hours)

MSDS Information: Phone: 800-804-3978
Email: info@betterbiltchemical.com
Internet: www.betterbiltchemical.com

2. HAZARDS IDENTIFICATION

Emergency Overview

DANGER!

Causes Eye and Skin Burns
Reacts violently with water
May be Corrosive to Metals

NFPA

Appearance: Clear Viscous
Physical Form: Liquid
Odor: Acrid

Potential Health Effects

Eye: Corrosive. Contact may cause severe irritation, eye burns, and permanent eye damage.

Skin: Corrosive. Contact may cause severe irritation, skin burns, and permanent skin damage. No information regarding skin absorption, however, corrosivity of material suggests significant skin absorption will occur.

Inhalation (Breathing): Corrosive. Harmful if inhaled. May cause severe irritation and burns of the nose, throat, and respiratory tract.

Ingestion (Swallowing): Corrosive. May be harmful if swallowed. May cause severe irritation and burns of the mouth, throat, and digestive tract.

Signs and Symptoms: Effects of overexposure may include severe irritation and burns of the mouth, nose, throat, respiratory, and digestive tract, coughing nausea, vomiting, wheezing, abdominal pain, bronchitis (lung inflammation), chest pain, pneumonitis (inflammation of the lungs), pulmonary edema (accumulation of fluids in the lungs) and perforation of the stomach.

Other Comments: Prolonged or repeated overexposure to acid mists has been reported to cause erosion of tooth enamel.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include skin disorders, eye disorders and respiratory (asthma-like) disorders.

See Section 11 for additional Toxicity Information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CASRN	Concentration*
Sulfuric Acid	7664-93-9	93-99
Water	7732-18-5	1-7

* All concentrations are percent by w eight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. FIRST AID MEASURES

Eye Contact: Immediately move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek immediate medical attention. Remove contact lenses if present and easy to do. For direct contact, immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 30 minutes. Seek immediate medical attention.

Skin Contact: Immediately flush affected area(s) with large amounts of water while removing contaminated shoes, clothing, and constrictive jewelry. 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 or a waterless hand cleaner. If irritation or redness develops, seek immediate medical attention. Wash contaminated clothing before reuse.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air in a position comfortable for breathing. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Do not induce vomiting. Corrosive material. If victim has any breathing difficulties, call for emergency help immediately. If victim is conscious and alert, immediately rinse mouth with water and dilute the ingested material by giving one glass of milk or water to drink; 1/2 glass to children under 5. Call a physician or poison center. If possible, do not leave victim unattended.

Notes to Physician: This material is corrosive and may cause acid burns, including gastroesophageal perforation. Late complications of severe acid burns include esophageal, gastric, or pyloric strictures and stenosis.

5. FIRE-FIGHTING MEASURES

NFPA 704 Hazard Class

Health: 3 **Flammability:** 0 **Instability:** 2 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: This material may ignite combustibles. Water Reactive. Contact with water can generate heat or flammable gases. Avoid using water for fire fighting. Closed containers exposed to extreme heat can rupture due to pressure buildup.

Extinguishing Media: Dry chemical, soda ash, lime, or sand is recommended. Do not use water.

Fire Fighting Instructions: If tank, railcar, or tank truck is involved in a fire, isolate for 1/2 mile in all diirections. Consider initial evacuation for 1/2 mile in all directions.

Fires involving small amount of combustibles may be smothered with suitable dry chemicals. Use water on combustibles burning but avoid using water directly on acid as it results in evolution of heat and causes splattering. Emergency responders in the immediate hazard area should wear bunker gear and self contained breathing apparatus. In addition, wear other appropriate protective equipment as conditions warrant (see section 8). For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely.

Hazardous Combustion Products: Combustion may yield oxides of sulfur.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. If spill/release in excess of EPA reportable quantity (see Section 15) is made into the environment, immediately notify the National Response Center (phone number 800-424-8802). Use water sparingly to minimize environmental contamination and reduce disposal requirements.

Methods for Containment and Clean-Up: Notify appropriate federal, state, and local agencies. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling: Wear eye/face protection. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Do not breathe vapors or mists. Use good personal hygiene practices and wear appropriate personal protective equipment.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes.

Conditions for safe storage: Protect container(s) against physical damage and exposure to water. Corrosive to most metals, especially when dilute. To prevent ignition of hydrogen gas generated from contact with metal containers, smoking, open flames, and sparks should not be permitted in storage areas. Store in corrosion resistant container with a resistant inliner. Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas. Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	US-ACGIH	OSHA	Other
Sulfuric Acid	TWA: 0.2 mg/m^3	TWA: 1 mg/m^3	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of gas/vapor tight eye protection that meets or exceeds ANSI Z.87.1 is recommended against potential eye contact, irritation, or injury. Depending on conditions of use, a full face respirator may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Butyl rubber, Viton (fluoroelastomers)

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying full face respirator equipped with acid gas cartridges/canisters with P100 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20 °C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Clear Viscous
Physical Form:	Liquid
Odor:	Acrid
Odor Threshold:	No data
pH:	1-2
Vapor Pressure:	1 mm HG @146 °F / 63°C
Vapor Density (air=1):	3.4
Boiling Point/Range:	599-640 °F / 315-338°C
Melting/Freezing Point:	No data
Solubility in Water:	100%
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	1.82-1.84 @ 68ºF (20ºC)
Bulk Density:	15.2 lbs/gal
Percent Volatile:	Negligible
Evaporation Rate (nBuAc=1):	<1
Flash Point:	Not applicable
LEL (vol % in air):	No data
UEL (vol % in air):	No data
Autoignition Temperature:	No data

10. STABILITY AND REACTIVITY

Stability: Water reactive. Contact with water can cause violent reaction. Corrosive to metal. Can react with common metals generating hydrogen gas.

Conditions to Avoid: Avoid contact with water or moisture. Heat will increase overall reactivity.

Materials to Avoid (Incompatible Materials): Highly reactive and capable of igniting finely divided 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 (e.g., chlorine bleach), sulfides, or cyanides will produce toxic gases. Water reactive. Reacts violently with water, alkaline materials, or organic materials with evolution of heat. Corrosive to metal. Attacks many metals, releasing hydrogen gas (see Section 5).

Hazardous Decomposition Products: Sulfuric acid can release toxic and irritating sulfur oxide fumes when heated.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

Sulfuric Acid

Carcinogenicity: The International Agency for Research on Cancer (IARC) classified "strong inorganic acid mists containing sulfuric acid" as a Category I carcinogen (known human carcinogen) based upon epidemiology studies demonstrating excess pharyngeal and lung cancer in chronically exposed workers.

Acute Data:

Component	Oral LD50	Dermal LD50	Inhalation LC50
Sulfuric Acid	2140 mg/kg (Rat)	No data	510 mg/m 3 2 Hr. (Rat)
Water	Not Hazardous	Not Hazardous	Not Hazardous

12. ECOLOGICAL INFORMATION

Ecological Information: Not evaluated.

13. DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

‡ D002 - Corrosivity characteristic
‡ D003 - Reactivity characteristic

14. TRANSPORTATION INFORMATION

U.S. Department of Transportation (DOT)

Shipping Description:	Sulfuric acid, 8, UN1830, II, RQ *
Non-Bulk Package Marking:	Sulfuric acid, UN1830
Non-Bulk Package Labeling:	Corrosive
Bulk Package/Placard Marking:	Corrosive / 1830
Packaging - References:	49 CFR 173.154; 173.202; 173.242 ***(Exceptions; Non-bulk; Bulk)***
Hazardous Substance:	See Section 15 for RQ`s
Emergency Response Guide:	137
Note:	**** Omit "RQ" if the amount in a single packaging is less than the EPA Reportable Quantity amount shown in Section 15 for the hazardous substance.*** ***Shipping description may be modified by placing the UN or NA number as the first element. This order becomes mandatory on January 1, 2013.***

International Maritime Dangerous Goods (IMDG)

Shipping Description:	UN1830, Sulfuric acid, 8, II
Non-Bulk Package Marking:	Sulphuric acid, UN1830
Labels:	Corrosive
Placards/Marking (Bulk):	Corrosive / 1830
Packaging - Non-Bulk:	P001
EMS:	F-A, S-B
Note:	***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.***

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #:	UN1830
Proper Shipping Name:	Sulphuric acid
Hazard Class/Division:	8
Subsidiary risk:	None
Packing Group:	II
Non-Bulk Package Marking:	Sulphuric acid, UN1830
Labels:	Corrosive
ERG Code:	8L
Note:	***U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.***

14. TRANSPORTATION INFORMATION

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y809	809	813
Max. Net Qty. Per Package:	0.5 L	1 L	30 L

15. REGULATORY INFORMATION

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPQ	EPCRA RQ
Sulfuric Acid	1000 lb	1000 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: Yes
Chronic Health: No
Fire Hazard: No
Pressure Hazard: No
Reactive Hazard: Yes

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration*	de minimis
Sulfuric Acid	93-99	1.0%

EPA (CERCLA) Reportable Quantity (in pounds):
This material does not contain any chemicals with CERCLA Reportable Quantities. This material contains the following chemicals subject to the reporting requirements of 40 CFR 302.4:

Component	RQ
Sulfuric Acid	1000 lb

California Proposition 65:
Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Strong Inorganic Acid Mists containing Sulfuric Acid	Cancer

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Regulations.

WHMIS Hazard Class
D1A
E - Corrosive Material

National Chemical Inventories:
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.
All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Issue Date: 01-Jul-2008

16. OTHER INFORMATION

Status:	Final
Previous Issue Date:	21-April-2006
Revised Sections or Basis for Revision:	Format change Review and update
MSDS Number:	10010

MSDS Legend:

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Agreement on Dangerous Goods by Road; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); EINECS - European Inventory of Existing Commercial Chemical Substances; EPA = [US] Environmental Protection Agency; Germany-TRGS = Technical Rules for Dangerous Substances; IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization / International Air Transport Association; IMDG = International Maritime Dangerous Goods; Ireland-HSA = Ireland's National Health and Safety Authority; LEL = Low er Explosive Limit; N/A = Not Applicable; N/D = Not Determined; NIOSH = National Institute for Occupational Safety and Health; NTP = [US] National Toxicology Program; OSHA = [US] Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; RID = Regulations Concerning the International Transport of Dangerous Goods by Rail; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value; TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; UK-EH40 = United Kingdom EH40/2005 Workplace Exposure Limits

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