

Material Safety Data Sheet

MSDS Revision Date: February 17, 2010

Page 1 of 5

PRODUCT: Sulfuric Acid (With more than 51% Acid)



1. Product and Company Identification

Product Identity: Sulfuric Acid (With more than 51% Acid)

Chemical Formula: H₂SO₄
Molecular Weight: 98.08

Synonyms: Sulfuric Acid 1.500, Sulfuric Acid 1.600, 50% by volume, 51 to 93% by weight, 42 to 66° Baume, Sulfuric acid greater than 51% acid. All grades including Food Grade and Kosher.

Brenntag Mid-South Inc.
1405 Hwy 136 W
Henderson, KY 42420

Technical Information: 270-830-1222
Emergency Number: 800-424-9300 (CHEMTREC)
Emergency Number: 703-5273887 (International)

2. Hazards Identification

Emergency Overview: Danger

WARNING! May be corrosive to the skin, eyes, and respiratory tract. Aspiration hazard if swallowed. Can enter lungs and cause damage. Cancer hazard.

Potential Health Effects

Inhalation: Can cause irritation or corrosive burns to upper respiratory system, including nose, mouth, and throat. Lung irritation and pulmonary edema can also occur. Pulmonary edema (body fluid in the lungs) with cough, wheezing, and abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed. Repeated or prolonged exposure to mists may cause corrosion of the teeth.

Ingestion: Can cause irritation and corrosive burns to mouth, throat, and stomach, with severe pain, bleeding, vomiting, diarrhea and collapse of blood pressure – damage may appear days after exposure.

Skin Contact: Contact with liquid may cause: skin corrosion, burns or ulcers. Contact with a 1% solution may cause: Slight irritation with itching, redness or swelling. Repeated and/or prolonged exposure to mists may cause: Irritation with itching, burning, redness, swelling or rash.

Eye Contact: Eye contact can cause irritation, corneal burns, and conjunctivitis. Blindness may result, or severe or permanent injury.

3. Composition/Information on Ingredients

CAS#	Chemical Name	Percent by Weight
7664-93-9	Sulfuric Acid	> 51%

FORM DATE: 6/4/2009

IMPORTANT: While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with the applicable federal, state, and local law. This MSDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.



Material Safety Data Sheet

MSDS Revision Date: February 17, 2010

Page 2 of 5

PRODUCT: Sulfuric Acid (With more than 51% Acid)

4. First Aid Measures

Inhalation: Remove victim to fresh air. Give artificial respiration if not breathing.

Ingestion: Drink large amounts of water or milk to dilute the acid. Do NOT induce vomiting. Get medical help immediately.

Skin Contact: Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing. Continue washing with water if medical treatment is not available.

Eye Contact: Immediately flush eyes with plenty of water while holding eyelids open. Get medical attention immediately.

5. Fire Fighting Measures

Go to Section 9 for Flammable Properties.

Fire: Acid itself is not flammable but can cause ignition by contact with combustible liquids and solids. Hydrogen gas can accumulate in containers and care must be taken not to ignite. Wear protective clothing including self-contained breathing apparatus.

Explosion: Not Applicable.

Fire Extinguishing Media: Dry chemical, carbon dioxide, water fog.

Special Information: Wear proper safety equipment when handling. Wash thoroughly after handling. Do not get in eyes, on skin or clothing. Do not breathe mist or fumes.

6. Accidental Release Measures

Personnel with proper protective equipment should contain spill. Recover material if possible. Dilute small spills or leaks cautiously with plenty of water. Neutralize residue with alkali such as soda ash or lime. Good ventilation is required for soda ash due to release of carbon dioxide gas.

7. Handling and Storage

Keep sources of ignition away. Store in a cool, well-ventilated area away from combustibles and reactive chemicals. Wear proper safety equipment when handling. Wash thoroughly after handling. Do not get in eyes, on skin or clothing. Do not breathe mist or fumes.

8. Exposure Controls/Personal Protection

OSHA Permissible Exposure Limit (PEL): Sulfuric acid: 1 mg/m³

Ventilation System: Local exhaust sufficient to reduce vapor and acid mist to permissible levels.

Skin Protection: Gauntlet gloves. Acid resistant chemical suit. Eye wash fountain and safety shower.

Eye Protection: Chemical splash goggles, full-face plastic shield.

FORM DATE: 6/4/2009

IMPORTANT: While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with the applicable federal, state, and local law. This MSDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.



Material Safety Data Sheet

MSDS Revision Date: February 17, 2010

Page 3 of 5

PRODUCT: Sulfuric Acid (With more than 51% Acid)

9. Physical and Chemical Properties

Appearance: Clear, colorless
Odor: Odorless
Physical State: Liquid
Melting Point: 93% = -20°F
Boiling Point: 256 - 468° F (124.6 -242.4° C)
Auto-ignition Temperature: No Information Found
Flash Point: Non flammable
Upper Explosive Limit: No Information Found
Lower Explosive Limit: No Information Found
Vapor Pressure (**mmHg**): 68° F < 0.001 mmHg
Vapor Density (**AIR = 1**): 1.7 Approximately
Specific Gravity: minimum 1.409 @ 60°F
Solubility in Water: Complete
Evaporation Rate (**Butyl Acetate = 1**): < 1

10. Stability and Reactivity

Chemical Stability: Stable

Conditions to Avoid: Temperature of 300° C or higher: yields sulfur trioxide gas, which is toxic, corrosive, and an oxidizer.

Incompatible Materials: Nitro compounds, carbides, dienes, alcohols (when heated), oxidizing agents, allyl compounds, and aldehydes. Reacts with most metals, especially when dilute, to give flammable, potentially explosive hydrogen gas. Follow appropriate National Fire Protection Association (NFPA) codes.

Hazardous Decomposition Products: Sulfur trioxide, also this is a fire risk if in contact with organic materials.

Polymerization: will not occur.

11. Toxicological Information

TOXICITY DATA: TEETH: Exposures to high concentrations (reportedly up to 16 mg/m³) cause dental erosion. Etching of teeth may occur after a few weeks exposure, progressing to erosion after a few months exposure. Dental etching and erosion occurred about 4 times as frequently in a high exposure group (over 0.3 mg/m³) compared to a low exposure group (below 0.07 mg/m³).

Carcinogenicity: Many studies have reported more cancer of the larynx and to a lesser extent the lungs, than expected, in a wide variety of processes involving the use of strong inorganic acids including sulfuric acid. Throughout these studies, sulfuric acid mists were the most common exposure, and in two studies, the number of cancers increased as exposure increased. Several of the studies had design weaknesses, such as exposure to other potentially carcinogenic chemicals at the same time. Nevertheless, some studies were well conducted and the overall trends indicate that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans. Examples of the processes studied include pickling, electroplating and other acid treatment of metals, the manufacture of lead-acid batteries and phosphate fertilizer production. The International Agency for Research on Cancer (IARC) has not evaluated the carcinogenicity of this chemical. However, IARC has concluded there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans (Group 1). IARC's classification is for inorganic acid mists containing sulfuric acid and does not apply to sulfuric acid or sulfuric acid solutions. The American Conference of Governmental Industrial Hygienists (ACGIH) has not assigned a carcinogenicity designation to this chemical. However, ACGIH has designated strong inorganic acid mists containing sulfuric acid as A2 (suspected human carcinogen). The US National Toxicology Program (NTP) has not listed this chemical in its report on carcinogens. However, the US NTP has listed strong inorganic acid mists containing sulfuric acid as a known human carcinogen.

FORM DATE: 6/4/2009

IMPORTANT: While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with the applicable federal, state, and local law. This MSDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.

Material Safety Data Sheet

MSDS Revision Date: February 17, 2010

Page 4 of 5

PRODUCT: Sulfuric Acid (With more than 51% Acid)



11. Toxicological Information

Teratogenicity and Embryotoxicity: No human information is available. One animal study indicated that sulfuric acid is not teratogenic, even at maternally toxic doses.

Reproductive Toxicity: No human or animal information is available.

Mutagenicity: There was a significantly higher number of sister chromatid exchanges, micronuclei and chromosomal aberrations in cultured lymphocytes (white blood cells) from workers exposed to sulfur dioxide in a sulfuric acid factory. There was no correlation with length of service. No conclusions can be made based on this information.

Toxicologically Synergistic Materials: No information is available.

Potential for Accumulation: Sulfuric acid mist is absorbed through mucous membranes, ultimately into the bloodstream. The sulfate anion becomes part of the pool of sulfate anions in the body and is excreted in the urine in combination with other chemicals in the body. It is unlikely to accumulate in the body.

12. Ecological Information

ECOTOXICITY:

LC50 (rat): 510 mg/m³ (2 hour-exposure) (255 mg/m³ - equivalent 4-hour exposure)

LC50 (mouse): 320 mg/m³ (2-hour exposure) (160 mg/m³ - equivalent 4-hour exposure)

LD50 (oral, rat): 2140 mg/kg

Eye Irritation: Application of a 1% solution caused tissue death (necrosis) in rabbits. Application of a 5% solution, rinsed with water, caused clouding of the cornea and irritation in rabbits which cleared within 7 days; a 10% solution caused severe irritation and damage which persisted to day 7.

Effects of Short-Term (Acute) Exposure:

Inhalation: Low concentrations of aerosols have produced changes in lung function. There is species variation in sensitivity, with guinea pigs most sensitive (by a factor of 6), then rats and mice, with rabbits most resistant. Aerosol toxicity is influenced by particle size. No harmful changes were observed in rats following one week exposures to up to 100 mg/m³ (particle size 0.5-1.7 micrometres), while 30 mg/m³ caused fatal accumulation of fluid in the lungs (pulmonary edema) in guinea pigs. (5) The LC50 in guinea pigs ranged from 100 mg/m³ (particle size 0.4 micrometres) to 30-40 mg/m³ (particle size 0.8 micrometres) and 18 mg/m³ (particle size 2.7 micrometres). The animals that died probably suffocated following laryngeal spasm (due to severe irritation). The lowest concentration at which guinea pigs showed increased airway resistance was 0.1 mg/m³. There were no cardiovascular effects in dogs exposed briefly to 8 mg/m³ or to 4 mg/m³ for 4 hours.

Effects of Long-Term (Chronic) Exposure:

Inhalation: Chronic exposure to low concentrations by inhalation have produced changes in respiratory tissues and in measures of lung function. (5,6) In 3 studies, guinea pigs were exposed to 0.1 to 26.5 mg/m³ with particle sizes ranging from fine to coarse for periods of 18 to 140 days. Intermittent exposure produced only minimal lung changes while continuous exposure at lower concentrations (4 mg/m³) caused more extensive damage (fluid accumulation, bleeding and tissue damage). Changes were most marked for exposures with particle size of 0.9 um. No effects were seen at the lowest concentration (0.1 mg/m³). Monkeys were continuously exposed for 78 weeks to two concentrations, with two particle sizes. Effects on pulmonary function and respiratory cells were seen at 4.79 mg/m³ (particle size 0.73 um). At 0.48 mg/m³ (0.54 um) and 0.38 mg/m³ (2.15 um), only minimal effects were noted. In a guinea pig study, there were no effects following continuous exposure to 0.1 and 0.08 mg/m³ for 52 weeks. (6) Factors such as mucociliary clearance, alveolar defense mechanisms, cellular changes, and lung function have been evaluated in many studies. While changes in these parameters have been demonstrated, it is not clear whether they relate to chronic lung disease.

Teratogenicity, Embryotoxicity and/or Fetotoxicity:

Sulfuric acid was not teratogenic in mice and rabbits, but was slightly embryotoxic in rabbits (a minor, rare skeletal variation). The animals were exposed to 5 and 20 mg/m³ (1.6 and 2.4 um respectively) for 7 hours/day throughout pregnancy. Slight maternal toxicity was present at the highest dose in both species.

Mutagenicity:

There are no mutagenicity studies specifically of sulfuric acid. However, there are established effects of reduced pH in mutagenicity testing, as would be caused by sulfuric acid. These effects are an artifact of low pH and are not necessarily due to biological effects of sulfuric acid itself.

FORM DATE: 6/4/2009

IMPORTANT: While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with the applicable federal, state, and local law. This MSDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.



Material Safety Data Sheet

MSDS Revision Date: February 17, 2010

Page 5 of 5

PRODUCT: Sulfuric Acid (With more than 51% Acid)

13. Disposal Considerations

Waste disposal is to be in accordance with all Federal, State, and Local regulations and by an approved hazardous waste management facility.

14. Transport Information

PROPER SHIPPING NAME: Sulfuric Acid (with more than 51% acid)

HAZARD CLASS: 8 (Corrosive)

UN/NA: UN1830

PACKING GROUP: PG II

D.O.T. LABEL REQUIRED: Corrosive Material

REPORTABLE QUANTITY OF PRODUCT: 1000 lbs as H₂SO₄

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center and to you local Emergency Planning Committee.

15. Regulatory Information

TSCA (Toxic Substance Control Act): All components of this product are listed on the TSCA inventory.

SARA TITLE III: HAZARD CLASSIFICATIONS: Acute: Yes Chronic: Yes Fire: No Pressure: No Reactivity: Yes

Name	CAS	TSCA	SARA 302	SARA 304	SARA 313	CERCLA
Sulfuric acid	7664-93-9	yes	1000	1000	313	1000

16. Other Information

HMIS HAZARD RATING: Health 3 Flammability 0 Reactivity 2

This MSDS is provided as an information resource only. It should not be taken as a warranty or representation for which Brenntag assumes legal liability. While Brenntag believes the information contained herein is accurate and compiled from sources believed to be reliable, it is the responsibility of the user to investigate and verify its identity. The buyer assumes all responsibility for using and handling the product in accordance with applicable international, federal, state, and local regulations.

Brenntag Mid-South Inc.
1405 Hwy 136 W
Henderson, KY 42420

PREPARED BY: *Bryanne Blewitt*

APPROVED BY: *James Clark*

C:\RD1\WORD\MSDS\SAMOR51%

FORM DATE: 6/4/2009

IMPORTANT: While Brenntag believes the information contained herein to be accurate, Brenntag makes no representation or warranty, express or implied, regarding, and assumes no liability for, the accuracy or completeness of the information. The Buyer assumes all responsibility for handling, using and/or reselling the Product in accordance with the applicable federal, state, and local law. This MSDS shall not in any way limit or preclude the operation and effect of any of the provisions of Brenntag's terms and conditions of sale.