



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

**Material name** Spent Sulfuric Acid  
**Revision date** 06-10-2011  
**Version #** 01  
**CAS #** Mixture  
**MSDS Number** 605  
**Product use** This product is intended for use as a refinery feedstock, fuel or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.  
**Synonym(s)** Spent alkylation acid  
See section 16 for complete information.  
**Manufacturer/Supplier** Valero Marketing & Supply Company and Affiliates  
P.O. Box 696000  
San Antonio, TX 78269-6000  
General Assistance 210-345-4593  
**Emergency** 24 Hour Emergency 866-565-5220  
1-800-424-9300 (CHEMTREC USA)

## 2. Hazards Identification

**Physical state** Solid.  
**Appearance** Colorless to dark brown, oily liquid.  
**Emergency overview** DANGER!  
Causes skin, eye and respiratory tract burns. Harmful if inhaled. Possible cancer hazard - may cause cancer based on animal data.  
**OSHA regulatory status** This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).  
**Potential health effects**  
**Routes of exposure** Inhalation. Eye contact. Skin contact. Ingestion.  
**Eyes** Causes eye burns.  
**Skin** Causes skin burns.  
**Inhalation** Causes respiratory tract burns. Harmful if inhaled.  
**Ingestion** May cause burns in mucous membranes, throat, esophagus and stomach.  
**Chronic effects** Possible cancer hazard - may cause cancer based on animal data.  
**Signs and symptoms** Contact with this material will cause burns to the skin, eyes and mucous membranes. Persons with pre-existing respiratory tract, skin and lung (such as asthma) disorders may be aggravated by exposure to this product.  
**Potential environmental effects** The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

## 3. Composition / Information on Ingredients

Components	CAS #	Percent
Sulfuric acid	7664-93-9	88 - 92
Distillates (petroleum), alkylate	64741-73-7	6 - 8
Diethyl sulfate	64-67-5	<0.2
Dimethyl sulfate	77-78-1	<0.2

## Composition comments

This product is a blend of sulfuric acid and hydrocarbon produced in a sulfuric acid based petroleum alkylation unit. It may contain approximately 0.5% dialkyl sulfates including dimethyl and diethyl sulfate.

The alkylation distillates in this product are a complex combination of hydrocarbons produced by distillation of the reaction products of isobutene with mono-olefinic hydrocarbons usually ranging in carbon numbers from C3 through C5. It consists of predominately branched-chain saturated hydrocarbons having carbon numbers in the range of C11 through C17.

## 4. First Aid Measures

### First aid procedures

#### Eye contact

Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

#### Skin contact

Wash off immediately with soap and plenty of water. Remove contaminated clothing and shoes. Call a physician or poison control center immediately. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

#### Inhalation

Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician or poison control center immediately.

#### Ingestion

Rinse mouth thoroughly. Do not induce vomiting without advice from poison control center. Do not give mouth-to-mouth resuscitation. If vomiting occurs, keep head low so that stomach content does not get into the lungs. Call a physician or poison control center.

### Notes to physician

In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

### General advice

If exposed or concerned: get medical attention/advice. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use.

## 5. Fire Fighting Measures

### Flammable properties

No unusual fire or explosion hazards noted.

### Extinguishing media

#### Suitable extinguishing media

Water spray. Water fog. Dry chemical powder. Carbon dioxide (CO<sub>2</sub>).

#### Unsuitable extinguishing media

Do not use a solid water stream as it may scatter and spread fire.

### Protection of firefighters

#### Protective equipment and precautions for firefighters

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

### Fire fighting equipment/instructions

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. In the event of fire, cool tanks with water spray.

### Specific methods

In the event of fire and/or explosion do not breathe fumes.

### Hazardous combustion products

Carbon oxides. Sulfur oxides.

## 6. Accidental Release Measures

### Personal precautions

Keep unnecessary personnel away. Local authorities should be advised if significant spills cannot be contained. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.

### Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Review Fire Fighting Measures section before proceeding with clean up. Stop leak if it can be done without risk. Use water spray to disperse vapors. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 800-424-8802. For highway or railway spills, contact Chemtrec at 800-424-9300.

### Methods for containment

Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.

## Methods for cleaning up

Small spills: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste.

Large Spills: Prevent product from entering drains. Do not allow material to contaminate ground water system. Should not be released into the environment.

## Other information

Clean up in accordance with all applicable regulations.

## 7. Handling and Storage

### Handling

Wear personal protective equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, on clothing. Do not taste or swallow. Avoid prolonged exposure. Use only with adequate ventilation. Wash thoroughly after handling. When using, do not eat, drink or smoke. Avoid release to the environment.

### Storage

Keep container tightly closed in a cool, well-ventilated place. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children.

## 8. Exposure Controls / Personal Protection

### Occupational exposure limits

#### ACGIH

Material	Type	Value	Form
Spent Sulfuric Acid (Mixture)	TWA	0.5 mg/m <sup>3</sup>	(total dust)

#### US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Dimethyl sulfate (77-78-1)	TWA	0.1 ppm	
Sulfuric acid (7664-93-9)	TWA	0.2 mg/m <sup>3</sup>	Thoracic fraction.

#### US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Dimethyl sulfate (77-78-1)	PEL	5 mg/m <sup>3</sup> 1 ppm
Sulfuric acid (7664-93-9)	PEL	1 mg/m <sup>3</sup>

#### Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Dimethyl sulfate (77-78-1)	TWA	0.1 ppm 0.5 mg/m <sup>3</sup>
Sulfuric acid (7664-93-9)	STEL TWA	3 mg/m <sup>3</sup> 1 mg/m <sup>3</sup>

#### Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Dimethyl sulfate (77-78-1)	Ceiling	0.1 ppm
Sulfuric acid (7664-93-9)	TWA	0.2 mg/m <sup>3</sup>

#### Canada. Ontario OELs. (Ministry of Labor - Control of Exposure to Biological or Chemical Agents)

Components	Type	Value	Form
Dimethyl sulfate (77-78-1)	TWA	0.5 mg/m <sup>3</sup> 0.1 ppm	
Sulfuric acid (7664-93-9)	TWA	0.2 mg/m <sup>3</sup>	Thoracic fraction.

#### Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Dimethyl sulfate (77-78-1)	TWA	0.1 ppm 0.52 mg/m <sup>3</sup>
Sulfuric acid (7664-93-9)	STEL TWA	3 mg/m <sup>3</sup> 1 mg/m <sup>3</sup>

## Mexico. Occupational Exposure Limit Values

Components	Type	Value
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Dimethyl sulfate (77-78-1)	TWA	0.1 ppm 0.52 mg/m <sup>3</sup>
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<b>Engineering controls</b>	Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.
<b>Personal protective equipment</b>	
<b>Eye / face protection</b>	Safety glasses.
<b>Skin protection</b>	Wear chemical-resistant, impervious gloves. Full body suit and boots are recommended when handling large volumes or in emergency situations. Flame retardant protective clothing is recommended.
<b>Respiratory protection</b>	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workplace exposure limits for product or components are exceeded, NIOSH approved equipment should be worn. Proper respirator selection should be determined by adequately trained personnel, based on the contaminants, the degree of potential exposure and published respiratory protection factors. This equipment should be available for nonroutine and emergency use.
<b>General hygiene considerations</b>	Consult supervisor for special handling instructions. Keep away from food and drink. Wash hands before breaks and immediately after handling the product. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical & Chemical Properties

<b>Appearance</b>	Colorless to dark brown, oily liquid.
<b>Color</b>	Colorless to dark brown.
<b>Odor</b>	Hydrocarbon.
<b>Odor threshold</b>	Not available.
<b>Physical state</b>	Solid.
<b>Form</b>	Oily liquid.
<b>pH</b>	Acidic
<b>Melting point</b>	51 °F (10.56 °C)
<b>Freezing point</b>	Not available.
<b>Boiling point</b>	554 °F (290 °C)
<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Flammability limits in air, upper, % by volume</b>	Not available.
<b>Flammability limits in air, lower, % by volume</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Specific gravity</b>	1.84
<b>Solubility (water)</b>	Soluble.
<b>Partition coefficient (n-octanol/water)</b>	No data available.
<b>Auto-ignition temperature</b>	Not available.
<b>Decomposition temperature</b>	Not available.

## 10. Chemical Stability & Reactivity Information

<b>Chemical stability</b>	Stable under normal temperature conditions and recommended use.
<b>Conditions to avoid</b>	None known.
<b>Incompatible materials</b>	Strong oxidizing agents. Reducing agents. Organic material. Acids. Water.
<b>Hazardous decomposition products</b>	Sulfur oxides.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.

## 11. Toxicological Information

### Toxicological data

Components	Test Results
Sulfuric acid (7664-93-9)	Acute Oral LD50 Rat: 2140 mg/kg
<b>Acute effects</b>	Causes skin, eye and respiratory tract burns. Harmful if inhaled.
<b>Local effects</b>	
<b>US ACGIH Threshold Limit Values: Skin designation</b>	
Dimethyl sulfate (CAS 77-78-1)	Can be absorbed through the skin.
<b>Chronic effects</b>	Repeated contact with dilute sulfuric acid solutions can cause dermatitis, and repeated or prolonged inhalation of a mist of sulfuric acid can cause inflammation of the upper respiratory tract, leading to chronic bronchitis. Inhalation of concentrated vapor or mists from hot acid or oleum can cause rapid loss of consciousness with serious damage to lung tissue. Severe exposure may cause a chemical pneumonitis; erosion of the teeth due to exposure to strong acid fumes has been recognized in industry.
<b>Carcinogenicity</b>	Possible cancer hazard - may cause cancer based on animal data.
<b>ACGIH Carcinogens</b>	
Dimethyl sulfate (CAS 77-78-1)	A3 Confirmed animal carcinogen with unknown relevance to humans.
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>	
Diethyl sulfate (CAS 64-67-5)	2A Probably carcinogenic to humans.
Dimethyl sulfate (CAS 77-78-1)	2A Probably carcinogenic to humans.
<b>US NTP Report on Carcinogens: Anticipated carcinogen</b>	
Diethyl sulfate (CAS 64-67-5)	Anticipated carcinogen.
Dimethyl sulfate (CAS 77-78-1)	Anticipated carcinogen.

## 12. Ecological Information

### Ecotoxicological data

Components	Test Results
Sulfuric acid (7664-93-9)	LC50 Western mosquitofish ( <i>Gambusia affinis</i> ): 42 mg/l 96 hours
<b>Ecotoxicity</b>	The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.
<b>Persistence and degradability</b>	No data available.
<b>Bioaccumulation / Accumulation</b>	No data available.
<b>Partition coefficient (n-octanol/water)</b>	No data available.
<b>Mobility in environmental media</b>	No data available.

## 13. Disposal Considerations

<b>Disposal instructions</b>	Dispose in accordance with all applicable regulations. Incinerate the material under controlled conditions in an approved incinerator. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container.
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## 14. Transport Information

### DOT

#### Basic shipping requirements:

UN number	UN1832
Proper shipping name	Sulfuric acid, spent
Hazard class	8
Packing group	II
Labels required	8

#### Additional information:

Special provisions	A3, A7, B2, B83, B84, IB2, N34, T8, TP2, TP12
Packaging exceptions	None
Packaging non bulk	202
Packaging bulk	242
ERG number	137

### IATA

#### Basic shipping requirements:

UN number	1832
Proper shipping name	Sulphuric acid, spent
Hazard class	8
Packing group	II

#### Additional information:

ERG code	8L
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### IMDG

#### Basic shipping requirements:

UN number	1832
Proper shipping name	SULPHURIC ACID, SPENT
Hazard class	8
Packing group	II
EmS No.	F-A, S-B

### TDG

#### Basic shipping requirements:

Proper shipping name	SULFURIC ACID, SPENT
Hazard class	8
UN number	UN1832
Packing group	II

#### Additional information:

Special provisions	19
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## 15. Regulatory Information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200 (OSHA) and 8 CCR § 5194 (Cal/OSHA). All components are on the U.S. EPA TSCA Inventory List.

#### TSCA Section 12(b) Export Notification(40 CFR 707, Subpt. D)

Not regulated.

#### US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

Dimethyl sulfate (CAS 77-78-1)	100 LBS
Sulfuric acid (CAS 7664-93-9)	1000 LBS

#### US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

Dimethyl sulfate (CAS 77-78-1)	500 LBS
Sulfuric acid (CAS 7664-93-9)	1000 LBS

#### US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

Diethyl sulfate (CAS 64-67-5)	0.1 %
Dimethyl sulfate (CAS 77-78-1)	0.1 %
Sulfuric acid (CAS 7664-93-9)	1.0 %

#### US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Diethyl sulfate (CAS 64-67-5)	Listed.
Dimethyl sulfate (CAS 77-78-1)	Listed.

Sulfuric acid (CAS 7664-93-9)

Listed.

**CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)**

Sulfuric acid: 1000  
Diethyl sulfate: 10  
Dimethyl sulfate: 100

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**  
Immediate Hazard - Yes  
Delayed Hazard - Yes  
Fire Hazard - No  
Pressure Hazard - No  
Reactivity Hazard - No

**Section 302 extremely hazardous substance (40 CFR 355, Appendix A)**  
Yes

**Section 311/312 (40 CFR 370)**  
Yes

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)**  
Not controlled

**WHMIS status**  
Controlled

**WHMIS classification**  
D1A - Immediate/Serious-VERY TOXIC  
E - Corrosive

**WHMIS labeling**



**Inventory status**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

**State regulations**

**US - California Hazardous Substances (Director's): Listed substance**

Diethyl sulfate (CAS 64-67-5) Listed.  
Dimethyl sulfate (CAS 77-78-1) Listed.  
Sulfuric acid (CAS 7664-93-9) Listed.

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Diethyl sulfate (CAS 64-67-5) Listed.  
Dimethyl sulfate (CAS 77-78-1) Listed.  
Sulfuric acid (CAS 7664-93-9) Listed.

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

Diethyl sulfate (CAS 64-67-5) Listed: January 1, 1988 Carcinogenic.  
Dimethyl sulfate (CAS 77-78-1) Listed: January 1, 1988 Carcinogenic.  
Sulfuric acid (CAS 7664-93-9) Listed: March 14, 2003 Carcinogenic.

**US - Massachusetts RTK - Substance: Listed substance**

Diethyl sulfate (CAS 64-67-5)	Listed.
Dimethyl sulfate (CAS 77-78-1)	Listed.
Sulfuric acid (CAS 7664-93-9)	Listed.

**US - New Jersey Community RTK (EHS Survey): Reportable threshold**

Diethyl sulfate (CAS 64-67-5)	500 LBS
Dimethyl sulfate (CAS 77-78-1)	500 LBS
Sulfuric acid (CAS 7664-93-9)	500 LBS

**US - New Jersey RTK - Substances: Listed substance**

Diethyl sulfate (CAS 64-67-5)	Listed.
Dimethyl sulfate (CAS 77-78-1)	Listed.
Sulfuric acid (CAS 7664-93-9)	Listed.

**US - Pennsylvania RTK - Hazardous Substances: Listed substance**

Diethyl sulfate (CAS 64-67-5)	Listed.
Dimethyl sulfate (CAS 77-78-1)	Listed.
Sulfuric acid (CAS 7664-93-9)	Listed.

**US - Pennsylvania RTK - Hazardous Substances: Special hazard**

Diethyl sulfate (CAS 64-67-5)	Special hazard.
Dimethyl sulfate (CAS 77-78-1)	Special hazard.

**16. Other Information****Other information**

Note: This Material Safety Data Sheet applies to the listed products and synonym descriptions for Hazard Communication purposes only. Technical Specifications vary greatly depending on the products and are not reflected in this document. Consult specification sheets for technical information.

**HMIS® ratings**

Health: 3\*  
Flammability: 1  
Physical hazard: 0

**NFPA ratings**

Health: 3  
Flammability: 1  
Instability: 0

**Disclaimer**

This Material Safety Data Sheet (MSDS) was prepared in accordance with 29 CFR 1910.1200 by Valero Marketing & Supply Co., ("VALERO"). VALERO does not assume any liability arising out of product use by others. The information, recommendations, and suggestions presented in this MSDS are based upon test results and data believed to be reliable. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all the scientific and study information in the format of this document, plus additional information may be necessary under exceptional conditions of use, or because of applicable laws or government regulations.

**Issue date**

06-10-2011