

Effective Date: 07/01/15
Replaces Revision: 01/01/13

NON-EMERGENCY TELEPHONE
610-866-4225

24-HOUR CHEMTREC EMERGENCY TELEPHONE
800-424-9300

SDS – SAFETY DATA SHEET

1. Identification

Product Identifier: SULFURIC ACID FUMING, 20%
Synonyms: Oleum, Disulfuric Acid, Pyrosulfuric Acid, Sulfuric Acid Mixed with Sulfur Trioxide
Chemical Formula: H₂SO₄ + 20% SO₃
Recommended Use of the Chemical and Restrictions On Use: Laboratory Reagent
Manufacturer / Supplier: Puritan Products; 2290 Avenue A, Bethlehem, PA 18017 **Phone:** 610-866-4225
Emergency Phone Number: 24-Hour Chemtrec Emergency Telephone 800-424-9300

2. Hazard(s) Identification

Classification of the Substance or Mixture:

Acute toxicity, Inhalation (Category 2)
Skin corrosion (Category 1A)
Specific target organ toxicity - single exposure (Category 3)

WHMIS Classification: Class D1 - Materials Causing Immediate and Serious Toxic Effects ≥1%
Class E — Corrosive Material at > 1%

Label Elements:

Signal Word: Danger



Hazard Statements:

H314: Causes severe skin burns and eye damage.
H330: Fatal if inhaled.
H335: May cause respiratory irritation.

Precautionary Statements:

P260: Do not breathe dust/ fume/ gas/ mist/ vapors / spray.
P280: Wear protective gloves / protective clothing / eye protection/ face protection.
P284: Wear respiratory protection.
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 POISON CENTER or doctor / physician.

3. Composition / Information on Ingredients

CAS Number: 8014-95-7

Index Number: 016-019-00-2

Ingredient	CAS Number	EC Number	Percent	Hazardous	Chemical Characterization
Sulfuric Acid	7664-93-9	231-639-5	Balance	Yes	Substance
Sulfur Trioxide	7446-11-9	231-197-3	20 - 29%	Yes	Mixture

4. First-aid Measures

In all cases, immediately call a POISON CENTER or doctor/ physician.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give Oxygen. Call a physician immediately.

Ingestion: DO NOT INDUCE VOMITING! Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician immediately.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately. Speed in diluting and rinsing with water is extremely important.

5. Fire-fighting Measures

Fire: Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

Explosion: Contact with most metals causes formation of flammable and explosive Hydrogen gas. A violent exothermic reaction occurs with water. Sufficient heat may be produced to ignite combustible materials.

Fire Extinguishing Media: Dry chemical, foam or Carbon Dioxide. DO NOT ADD water or other liquid to the acid.

Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers. Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

Environmental Precautions and Methods and Materials for Containment and Cleaning Up: Contain and recover liquid when possible. Do not let product enter drains. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth,) and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Precautions for Safe Handling and Conditions for Safe Storage, Including Any Incompatibilities: Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid.) Observe all warnings and precautions listed for the product.

8. Exposure Controls / Personal Protection

Airborne Exposure Limits:

Sulfuric Acid:

OSHA Permissible Exposure Limit (PEL) - 1 mg/m³ (TWA)

ACGIH Threshold Limit Value (TLV) - 0.2 mg/m³(T) (TWA)

A2 Suspected Human Carcinogen for sulfuric acid contained in strong inorganic mists

Ventilation System: A system of local and / or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved): For sulfuric acid: If the exposure limit is exceeded and engineering controls are not feasible, a full face piece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, Glycerin, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full face piece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in Oxygen-deficient atmospheres.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection: Use chemical safety goggles and / or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance: Colorless, oily, fuming liquid

Odor: Penetrating, sulfur trioxide

Odor Threshold: Not determined

pH: 1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1

% Volatiles by volume @ 21C (70F): No information found

Melting Point: 2C (35.6F)

Boiling Point / Boiling Range: 140C (284F) @ 760.00mmHg

Flash Point: Not applicable

Evaporation Rate (BuAC=1): Not determined

Flammability: Not applicable

Upper / Lower Flammability or Explosive Limits: Not applicable

Vapor Pressure (mm Hg): 5 mmHg at 37.7C (99.9F) / 2 mmHg at 25C (77F)

Vapor Density (Air=1): 3.4

Relative Density: No data available

Solubility: Miscible with water, liberates much heat

Partition Coefficient: n-octanol / water: No data available

Auto-ignition Temperature: No data available

Decomposition Temperature: No data available

Viscosity: No data available

10. Stability and Reactivity

Reactivity and / or Chemical Stability: Stable in tightly closed containers under normal conditions of storage. Extremely hygroscopic. Reacts exothermically with water.

Possibility of Hazardous Reactions and Conditions to Avoid: Heat, moisture, air, incompatibles.

Incompatible Materials: Water, Potassium Chlorate, Potassium Perchlorate, Potassium Permanganate, Sodium, Lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields Hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.

Hazardous Decomposition Products: Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate Carbon Dioxide gas, and with cyanides and sulfides to form poisonous Hydrogen Cyanide and Hydrogen Sulfide, respectively.

11. Toxicological Information

Acute Toxicity:

Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m³/2H; standard Draize, eye rabbit, 250 ug (severe) Investigated as a tumorigen, mutagen, reproductive effector.

Emergency Overview: POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG DAMAGE. WATER REACTIVE. STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE OR EXPLOSION. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Potential Health Effects:

Inhalation: Corrosive! Fuming sulfuric acid vapors, fumes and mists can burn all surfaces of the respiratory tract chemically as well as by heat of reaction with water. Coughing, choking and breathing difficulty can be immediate symptoms; tissue destruction, lung edema, etc. can follow severe exposure.

Ingestion: Corrosive! Causes very severe often fatal burns in the mouth and esophagus due to tissue destruction and heat. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death. Gastrointestinal upset and associated secondary symptoms may accompany the ingestion of small amounts.

Skin Contact: Corrosive! Can destroy skin layers and subsurface tissue on contact. Produces deep, slow healing burns. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.

Eye Contact: Corrosive! Vapors, fumes and mists can cause severe irritation. Can destroy eye tissue on contact. A painful burning sensation and tearing will be the immediate symptoms, scarring or loss of sight are expected.

Chronic Exposure: Damage to tooth enamel and injury to the respiratory tract may follow prolonged exposure to vapors. Chronic exposure to mists containing sulfuric acid is a cancer hazard.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

Carcinogenicity: Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

Specific Target Organ Toxicity - Single Exposure (Globally Harmonized System:) No data available.

Specific Target Organ Toxicity - Repeated Exposure (Globally Harmonized System:) No data available.

Germ Cell Mutagenicity: No data available.

Reproductive Toxicity: No data available.

Teratogenicity: 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 for 7 hr/day throughout pregnancy. Slight maternal toxicity was present at the highest dose in both species.

Aspiration Hazard: No data available.

Numerical Measures of Toxicity: Cancer Lists: NTP Carcinogen

Ingredient	Known	Anticipated	IARC Category
Sulfuric Acid, mixt. with Sulfur Trioxide	No	No	None
Sulfuric Acid (7664-93-9)	No	No	None
Sulfur Trioxide (7446-11-9)	No	No	None

12. Ecological Information

Ecotoxicity: This material is expected to be toxic to aquatic life.

LC50 Flounder 100 to 330 mg/l/48 hr aerated water / Conditions of bioassay not specified.

LC50 Shrimp 80 to 90 mg/l/48 hr aerated water / Conditions of bioassay not specified.

LC50 Prawn 42.5 ppm/48 hr salt water / Conditions of bioassay not specified.

Persistence and Degradability: Expected to readily biodegrade.

Bioaccumulative Potential: No further relevant information available.

Mobility in Soil: When released into the soil, this material may leach into groundwater.

Other adverse effects: US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

13. Disposal Considerations

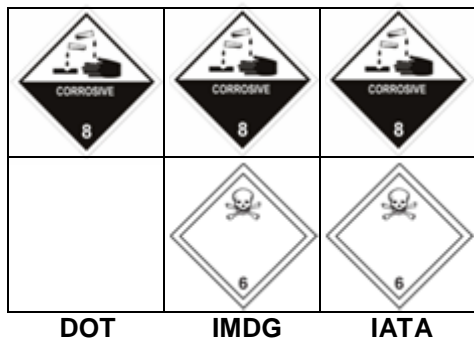
Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

UN Number: UN1831

UN Proper Shipping Name: SULFURIC ACID, FUMING (WITH LESS THAN 30% FREE SULFUR TRIOXIDE)

Packing Group: I



Land Transport ADR/RID and GGVS/GGVE (Cross Border / Domestic)

Transport Hazard Class(es): 8

Maritime Transport IMDG/GGVSea
Transport Hazard Class(es): 8, 6.1
Marine Pollutant: No

Air Transport ICAO-TI and IATA-DGR
Transport Hazard Class(es): 8, 6.1
IATA Passenger: Not permitted for transport
IATA Cargo: Not permitted for transport

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Special Precautions for User: Warning: Corrosive Substances

15. Regulatory Information

Chemical Inventory Status – Part 1

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid, mixt. with Sulfur Trioxide (8014-95-7)	Exempt	No	Yes	Yes
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Sulfur Trioxide (7446-11-9)	Yes	Yes	Yes	Yes

Chemical Inventory Status – Part 2

Ingredient	Korea	Canada		Phil.
		DSL	NDSL	
Sulfuric Acid, mixt. with Sulfur Trioxide (8014-95-7)	Yes	No	No	Yes
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Sulfur Trioxide (7446-11-9)	Yes	Yes	No	Yes

Federal, State & International Regulations - Part 1

Ingredient	SARA 302		SARA 313	
	RQ	TPQ	List Chemical	Catg.
Sulfuric Acid, mixt. with Sulfur Trioxide (8014-95-7)	No	No	No	No
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Sulfur Trioxide (7446-11-9)	100	100	No	No

Federal, State & International Regulations - Part 2

Ingredient	RCRA		TSCA
	CERCLA	261.33	8(d)
Sulfuric Acid, mixt. with Sulfur Trioxide (8014-95-7)	1000	No	No
Sulfuric Acid (7664-93-9)	1000	No	No
Sulfur Trioxide (7446-11-9)	1	No	No

Chemical Weapons Convention: No	TSCA 12(b): No		CDTA: Yes
SARA 311/312: Acute: Yes	Chronic: Yes	Fire: No	Pressure: No
Reactivity: Yes	Mixture / Liquid		

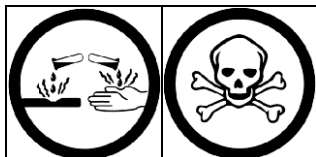
Australian Hazchem Code: 4WE

Poison Schedule: None allocated

16. Other Information

Effective Date: 07/01/15 – Added WHMIS 2015 Compliance, added WHMIS 1998 Symbols and TDG
Replaces Revision: 01/01/13 – GHS Compliant, 10/11/11 – Initial Release

WHMIS 1998 Symbols – Reference



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