



Material Safety Data Sheet

1. IDENTIFICATION

PRODUCT NAME: H2-SA 77-100%

CHEMICAL NAME/SYNONYMS: dihydrogen sulfate, oil of vitriol, vitriol brown oil, sulfuric acid

CHEMICAL FAMILY: acid

CHEMICAL FORMULA:

For emergencies call Chemtrec at 1-800-424-9300

2. HAZARD(S) IDENTIFICATION

WHMIS (Canada):

Class D-1A: very toxic material causing immediate and serious effects

Class E: corrosive material

Labeling (EEC): C Corrosive

See section 11 for more details for identification of exposure.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>CAS #</u>	<u>COMPONENT</u>	
	<u>PERCENT</u>	
7664-93-9	Sulfuric Acid	77.7
	60 Deg Technical	93.2
	66 Deg Technical	93.2
	1.835 Electrolyte	98
	98 % Technical	99
	99 % Technical	100
	100 % Technical	0-22
7732-18-5	Water	

4. FIRST-AID MEASURES

EYES: Remove contact lenses if present. Immediately flush eyes with plenty of water, holding eyelids open for at least 20 minutes. Consult a physician. Possible conjunctivitis, severe irritation, severe burns, permanent eye damage may also occur.

SKIN: Remove contaminated clothing and shoes as quickly as possible protecting your hands and body. Place under a deluge shower. Flush exposed skin gently and thoroughly with running water and non-abrasive soap (pay particular attention to: folds, crevices, creases, groin). Call a physician if irritation persists. May irritate skin, cause burns (highly corrosive) and possibly leave some scarring. Wash contaminated clothing before reusing. While the patient is being transported to a medical facility, continue the application of cold, wet compresses. If medical treatment must be delayed, repeat the flushing with cold water or soak the affected area with cold water to help remove the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of treatment.

INGESTION: DO NOT INDUCE VOMITING. Conscious and alert person: rinse mouth with water and give ½ to 1 cup of water or milk to dilute material. Spontaneous vomiting: keep the head below hips to prevent aspiration; rinse mouth and give ½ to 1 cup of water or milk.

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UNCONSCIOUS person: DO NOT INDUCE VOMITING OR GIVE ANY LIQUID.
Immediately obtain medical attention.

INHALATION: Take precautions to avoid secondary contamination by residual acids. Remove the person to fresh air. If not breathing, give artificial respiration. Difficult breathing: Give oxygen. Get immediate medical attention. Possible damage to the upper respiratory tract and lung tissues can occur. Maintain observation of the patient for delayed onset of pulmonary edema. May cause irritation to the upper respiratory tract: coughing, sore throat, shortness of breath.

NOTES TO PHYSICIAN: Continued washing of the affected area with cold or iced water will be helpful in removing the last traces of sulfuric acid. Creams or ointments should not be applied before or during the washing phase of the treatment.

5. FIRE-FIGHTING MEASURES**GENERAL FIRE HAZARDS:**

FLASH POINT: nonflammable

UPPER FLAMMABLE LIMIT (UFL): N/A

LOWER FLAMMABLE LIMIT (LFL): N/A

AUTO IGNITION: N/A

EXTINGUISHING MEDIA: Use media appropriate for surrounding area. Use water spray to cool containers exposed to fire. Do not get water inside containers.

FIRE FIGHTING EQUIPMENT/INSTRUCTIONS: evacuate personnel to a safe area. Keep personnel removed and upwind of fire. This product generates heat upon addition of water, with possibility of spattering. Wear full protective clothing. Run-off from fire control may cause pollution. Neutralize run-off with lime, soda ash, etc., to prevent corrosion of metals and formation of hydrogen gas. Where self-contained breathing apparatus if fumes or mists are present.

UNUSUAL FIRE AND EXPLOSION HAZARDS: reacts with most metals, especially when dilute which can release hydrogen gas (extremely flammable, explosive). Risk of explosion when acid- combined with water, organic materials or base solutions in enclosed spaces exists. Follow appropriate National Fire Protection Association codes.

NFPA CODES: HEALTH: 3 FIRE: 0 REACTIVITY: 2 SPECIAL HAZARD: ACID

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

ACTIONS TO TAKE FOR SPILLS OR LEAKS: review fire and explosion hazards and safety precautions before proceeding with clean-up. Stop flow if possible. Soak up small spills with sand, clay or diatomaceous earth. Dike large spills and cautiously dilute and neutralize with lime or soda ash and transfer to wastewater treatment system. Prevent liquid from entering sewers, waterways, or low areas.

If this product is spilled and not recovered, or is recovered as a waste for treatment or disposal, the reportable quantity is 1000lbs (based on the sulfuric acid content of the solution spilled). Comply with Federal, state, and local regulations on reporting releases.

For all transportation accidents, call Chemtrec at 800-424-9300

7. HANDLING AND STORAGE

HANDLING: Do not get into eyes, on skin, or on clothing. Avoid breathing vapors or mist. Wear approved respirators if adequate ventilation cannot be provided. Wash thoroughly after handling.

STORAGE: sulfuric acid must be stored in containers or tanks that have been specially designed for use with sulfuric acid. Do not add water or other products to contents in containers as violent reactions will result with resulting high heat, pressure and/or generation of

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hazardous acid- mists. Keep containers away from heat, sparks, and flame. All closed containers must be safely vented before each opening.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE GUIDELINES:**

COMPONENT	EXPOSURE LIMITS, MG/M3		
	OSHA PEL-TWA	ACGIH TLV-TWA	Other Limit
Sulfuric Acid	1	.2 (thoracic fr.)	
60 Deg Technical	1	.2 (thoracic fr.)	
66 Deg Technical	1	.2 (thoracic fr.)	
1.835 Electrolyte	1	.2 (thoracic fr.)	
98 % Technical	1	.2 (thoracic fr.)	
99 % Technical	1	.2 (thoracic fr.)	
100 % Technical	1	.2 (thoracic fr.)	
Water	not established	not established	

Note: sulfuric acid exposure limits may be different in other jurisdictions. NIOSH REL-TWA (<10hrs): 1 mg/m³; IDLH: 15mg/m³.

Consult local authorities for acceptable exposure limits.

ENGINEERING CONTROLS: good general ventilation should be provided to keep vapor and mist concentrations below the exposure limits.

INDIVIDUAL PROTECTION: chemical splash goggles; full-length face shield/chemical splash goggles combination; acid- proof gauntlet gloves, apron, and boots; long sleeve wool, acrylic, or polyester clothing; acid- proof suit and hood; appropriate NIOSH respiratory protection.

In case of emergency or where there is a strong possibility of considerable exposure, wear a complete acid- suit with hood, boots, and gloves. If acid- vapor or mist are present and exposure limits may be exceeded, where appropriate NIOSH respiratory protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	liquid (oily; clear to turbid)
ODOR:	odorless
MOLECULAR WEIGHT:	98.08
COLOR:	colorless to light gray
PH: (1% solution/water)	< 1
VOLATILITY:	< 1 (Butyl acetate = 1)
BOILING POINT IN °F:	193°C to 327°C 760 mm Hg
VAPOR DENSITY:	3.4
MELTING POINT:	-35°C to 11°C
DISPERSION:	yes
VAPOR PRESSURE @ 25°C (KPA):	< .3 Hg
VAPOR PRESSURE @ 38°C (KPA):	< .6 Hg
WATER SOLUBILITY:	yes

GRADE	BOILING POINT (°C)	FREEZING POINT(°C)	SPECIFIC GRAVITY
60 Deg Technical	193	-12	1.706
66 Deg Technical	279	-35	1.835
1.835 Electrolyte	279	-35	1.835
98 % Technical	327	-2	1.844
99 % Technical	310	4	1.842
100 % Technical	274	11	1.839

10. STABILITY AND REACTIVITY

HAZARDOUS POLYMERIZATION: Hazardous Polymerization will not occur

CHEMICAL STABILITY: yes, under normal conditions

CONDITIONS TO AVOID: Heat: possibility of decomposition. Release of dangerous gases (sulfur oxides SO₂, SO₃)

INCOMPATIBILITY: Vigorous reactions with: water; alkaline solutions; metals, metal powder; carbides; chlorates; fulminates; nitrates; picrates; strong oxidizing, reducing, or combustible organic materials. Hazardous gases are evolved on contact with chemicals such as cyanides, sulfites, and carbides.

REACTIVITY: Reacts violently with water and organic materials with evolution of heat.

CORROSIVITY: yes

11. TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY: ingestion, inhalation, skin and eye contact

CARCINOGENICITY: strong inorganic acid- mists containing sulfuric acid (occupational exposures): proven (human, group 1, IARC); suspected (human, group A2, ACGIH); group X (NTP); classification not applicable to sulfuric acid and sulfuric acid solutions.

MUTAGENICITY: N/A

TERATOGENICITY: N/A

ACUTE TOXICITY: Oral (LD50): 2 140 mg/kg (rat)

Inhalation (LC50, 2 hours): 510 mg/m³ (rat); 320 mg/m³ (mouse). RTECS

ACUTE EFFECTS: may be fatal if inhaled or ingested in large quantities. Liquids or acid- mists may produce tissue damage to the mucous membranes of the eyes, mouth or respiratory tract. Extremely dangerous by eye and skin contact. Product is a severe irritant to the eyes causing inflammation, redness, watering and itching. Very dangerous in case of inhalation at high concentrations; I may produce severe irritation of respiratory tract (coughing, shortness of breath, choking).

CHRONIC EFFECTS: overexposure to strong inorganic mists containing sulfuric acid: possibility of laryngeal cancer (HSBD, IARC). Target organs for acute and chronic overexposure (NIOSH 90-117): respiratory system, eyes, skin, teeth. Acid mists can cause irritation of the nose and throat with sneezing, sore throat or runny nose, headache, nausea and weakness.

Gross overexposure can cause irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath, pulmonary edema with coughing, wheezing, 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 product may cause corrosion of teeth.

Skin contact may result in corrosion, burns or ulcers.

Eye contact may result in corrosion or ulceration or blindness. May also cause irritation with tearing, pain or blurred vision.

Ingestion may result in burns of the mouth, throat, esophagus and stomach, with severe pain, bleeding, of a mining, diarrhea and collapse of blood pressure. Damage may appear days after exposure.

Eating, drinking and smoking must be prohibited in areas where this material is handled or processed. Wash hands and face before eating, drinking and smoking.

12. ECOLOGICAL INFORMATION

ECOTOXICITY: aquatic toxicity: slightly to moderately toxic

Bluegill sunfish (LC 50; 48 hours): 49mg/ L (tap water, 20°C, conditions of bioassay not specified). (HSBD)

Flounder (LC 50; 48 hours): 100 – 330 mg/L (aerated water, conditions of bioassay not specified). (HSBD)

TOXICITY TO ANIMALS: eye: concentrated compound is corrosive. 10% solution: moderate eye irritant.

MSDS

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Skin: concentrated compound is corrosive. 10% solution: slight skin irritant.
Single and repeated exposure: Irritation of the respiratory tract; corrosion of the respiratory tract; lung damage; labored breathing; altered respiratory rate, pulmonary edema. Repeated exposure: altered red blood cell count.

MOBILITY (SOIL): easy soil seeping under rain action

PERSISTENCE AND DEGRADABILITY: sulfate ion: ubiquitous in the environment. Metabolized by microorganisms and plants.

BIOACCUMULATION: sulfate ion: ubiquitous in the environment. Metabolized by microorganisms and plants without bioaccumulation.

BIODEGRADATION PRODUCTS: N/A

REMARKS ON ENVIRONMENT: due to the product's composition, particular attention must be taken for transportation and storage. Protect from rain because the runoff water will become acidic in may be harmful to flora and fauna.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: Cleaned-up material may be a hazardous waste on Resource conservation and Recovery Act (RCRA) on disposal due to the corrosivity characteristic. Do not flush to surface water or sanitary sewer system. Comply with Federal, state and local regulations. If approved, neutralize and transfer to waste treatment system.

14. TRANSPORT INFORMATION

This material is regulated as a DOT Hazardous Material.

US DOT INFORMATION:

<u>UN/NA #</u>	<u>Shipping Name Hazard</u>	<u>Class</u>	<u>Packing Group</u>	<u>ERG</u>	<u>RQ</u>
UN1830,	Sulfuric Acid,	8,	II,	137	1000lbs

15. REGULATORY INFORMATION

TSCA Inventory Status: Listed on inventory

SARA-302 Listed Chemical: Yes

SARA-313 Listed Chemical: Yes

CERCLA: Yes

Strong inorganic acid- mists containing sulfuric acid: chemical listed effective March 14, 2003 to the state of California, proposal 65. Sulfuric acid- is a class B. drug precursor under Health Canada's Controlled Drugs and Substances act and Precursor Control Regulations.

U.S. FDA Food Bioterrorism Regulations

Classifications HCS

Dangerous, may cause cancer

Corrosive liquid

16. OTHER INFORMATION

Do not use ingredient information and/ or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from H2O Technical Services.

DISCLAIMER:

We believe that the information in this MSDS is accurate. The suggested procedures are based on experience as of the date of publication. They are not necessarily either all-inclusive or fully adequate in every circumstance. Also, these suggestions should not be confused with or followed in violation of applicable laws, regulations, rules or insurance requirements.

NO WARRANTY IS MADE, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.