

SECTION 1. PRODUCT IDENTIFICATION

Trade Name 77 % - 100 % Sulfuric Acid
Product Code None
Manufacturers/Distributors NorFalco LLC, 6050 Oak Tree Blvd, Suite 190, Independence, OH U.S.A. 44131
 NorFalco Sales Inc., 6755 Mississauga Road, Suite 304, Mississauga, Ontario L5N 2Y7
Information Contact André Auger, Administration Assistant
Product Information 1-905-542-6901 (Mississauga)
Phone Number (Transportation Emergency) Canada 1-877-ERP-ACID (377-2243)
Phone Number (Transportation Emergency) U.S.A. 1-800-424-9300 CHEMTREC
Phone Number (Medical Emergency) **1-418-656-8090**
Synonyms Dihydrogen Sulfate ; Oil of Vitriol ; Vitriol Brown Oil
 Acide sulfurique (French)
Name / Chemical Formula Sulfuric Acid / H₂SO₄
Chemical Family Acid
Utilization Chemical industries
Manufacturers CEZinc on behalf of Noranda Income Limited Partnership, Salaberry-de-Valleyfield (Quebec) Canada J6S 4W2
 Xstrata Copper, Horne Smelter, Rouyn-Noranda (Quebec) J9X 5B6
 Xstrata Zinc, Brunswick Smelting Division, Belledune, New Brunswick E0B 1G0
 Xstrata Copper, Kidd Creek Division, Timmins, Ontario P4N 7K1
 Xstrata Nickel, Sudbury Operations, Falconbridge, Ontario P0M 1S0

SECTION 2. HAZARDS IDENTIFICATION

WHMIS (Canada) CLASS D-1A : Very toxic material causing immediate and serious effects
 CLASS E : Corrosive material
Labeling (EEC) C Corrosive



SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Name	CAS #	Percentage (%)	# CE	R Phrases ¹
Sulfuric (Acid)	7664-93-9	77 % to 100 %	231-639-5	R35
60 Deg Technical		77.7		
66 Deg Technical		93.2		
1.835 Electrolyte		93.2		
98 % Technical		98		
99 % Technical		99		
100 % Technical		100		
Water	7732-18-5	0-22		

Note 1 : See section 15 for the complete wording of risk phrases.

SECTION 4. FIRST-AID MEASURES

Eye Contact Remove contact lenses if present. Immediately flush eyes with plenty of water, holding eyelids open for at least 15 minutes. Consult a physician. Possibility of conjunctivitis, severe irritation, severe burns, permanent eye damage.

Skin Contact Remove contaminated clothing and shoes as quickly as possible protecting your hands and body. Place under a deluge shower for 15 minutes. Flush exposed skin gently and thoroughly with running water (Pay particular attention to : Folds, crevices, creases, groin). Call a physician if irritation persists. May irritate skin, cause burns (Highly corrosive) and possibility of 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.*

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. Possibility of damage to the upper respiratory tract and lung tissues. Maintain observation of the patient for delayed onset of pulmonary oedema. May cause irritation to the upper respiratory tract : Coughing, sore throat, shortness of breath.

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 head below hips to prevent aspiration ; Rinse mouth and give ½ to 1 cup of water or milk. **UNCONSCIOUS person : DO NOT** induce vomiting or give any liquid. **Immediately** obtain medical attention.

Notes to Physicians

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.

SECTION 5. FIRE-FIGHTING MEASURES

Flash Point	Not available
Flammable Limits	Not available
Auto-Ignition Temperature	Not available
Products of Combustion	Releases of sulfur dioxide at extremely high temperatures.
Fire Hazard	Not flammable
Explosion Hazard	Reacts with most metals, especially when dilute : Hydrogen gas release (Extremely flammable, explosive). Risk of explosion when acid combined with water organic materials or base solutions in enclosed spaces (Vaccum trucks, tanks). Follow appropriate <i>National Fire Protection Association</i> (NFPA) codes.
Extinguishing media	Use media appropriate for surrounding material. Use water spray to cool containers exposed to fire ; DO NOT get water inside containers.
Protective equipment	Evacuate personnel to a safe area. Keep personnel removed and upwind of fire. Generates heat upon addition of water, with possibility of spattering. Wear full protective clothing. Runoff from fire control may cause pollution. Neutralize run-off with lime, soda ash, etc., to prevent corrosion of metals and formation of hydrogen gas. Wear self-contained breathing apparatus if fumes or mists are present.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Spill	Review Fire and Explosion Hazards and Safety Precautions before proceeding with clean up. Stop flow if possible. Soak up small spills with dry sand, clay or diatomaceous earth.
Methods	Dike large spills, and cautiously dilute and neutralize with lime or soda ash, and transfer to waste water 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 (U.S. DOT) is 1 000 lbs (Based on the sulfuric acid content of the solution spilled). Comply with Federal, State, and local regulations on reporting releases.
Protective equipment	Review Fire Fighting Measures and Handling (Personnel Protection) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

SECTION 7. HANDLING AND STORAGE

Handling	Do not get in eyes, on skin, or on clothing. Avoid breathing vapours or mist. Wear approved respirators if adequate ventilation cannot be provided. Wash thoroughly after handling. Ingestion or inhalation : Seek medical advice immediately and provide medical personnel with a copy of this MSDS.
Conditions for 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 hazardous acid mists. Keep containers away from heat, sparks, and flame. All closed containers must be safely vented before each opening. For more information on sulfuric acid tanks, truck tanks and tank cars including safe unloading information go to www.norfalco.com .

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Name	CAS #	ACGIH (U.S.A.) 2007	OSHA (U.S.A.)
		TLV-TWA (mg/m ³)	PEL - TWA (mg/m ³)
Sulfuric (Acid)	7664-93-9	0.2 (thoracic fr.)	1
60 Deg Technical		0.2 (thoracic fr.)	1
66 Deg Technical		0.2 (thoracic fr.)	1
1.835 Electrolyte		0.2 (thoracic fr.)	1
98 % Technical		0.2 (thoracic fr.)	1
99 % Technical		0.2 (thoracic fr.)	1
100 % Technical		0.2 (thoracic fr.)	1
Water	7732-18-5	Not established	Not established

ACGIH : American Conference of Governmental Industrial Hygienists. OSHA : Occupational Safety and Health Administration.

Note : **Sulfuric (Acid)** : Exposure limits may be different in other jurisdictions. NIOSH REL-TWA (≤10 hours) : 1 mg/m³ ; IDLH : 15 mg/m³.

Consult local authorities for acceptable exposure limits.

Engineering Controls Good general ventilation should be provided to keep vapour 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 vapour or mist are present and exposure limits may be exceeded, wear appropriate NIOSH respiratory protection.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance	Liquid (Oily ; Clear to turbid)	Odour	Odourless
Molecular Weight	98.08	Colour	Colourless to light grey
pH (1% soln/water)	< 1	Volatility	< 1 (Butyl Acetate = 1.0)
Boiling Point	193°C to 327 °C (379°F to 621°F) @ 760 mm Hg	Vapour Density	3.4
Melting Point	-35°C to 11°C (-31°F to 52°F)	Dispersion	Yes (Water)
Vapour Pressure	< 0.3 mm Hg @ 25°C (77 °F) < 0.6 mm Hg @ 38°C (100 °F)	Solubility	Yes (Water)

GRADE	Boiling Point		Freezing Point		Specific Gravity
	DEG °C	DEG °F	DEG °C	DEG °F	
60 DEG TECHNICAL	193	380	- 12	10	1.706
66 DEG TECHNICAL	279	535	- 35	- 31	1.835
1.835 ELECTROLYTE	279	535	- 35	- 31	1.835
98 % TECHNICAL	327	621	- 2	29	1.844
99 % TECHNICAL	310	590	4	40	1.842
100 % TECHNICAL	274	526	11	51	1.839

SECTION 10. STABILITY AND REACTIVITY

Stability	Yes (Under normal conditions of ambient temperature)
Reactivity	Reacts violently with water and organic materials with evolution of heat.
Conditions to avoid	Heat : Possibility of decomposition. Release of dangerous gases (Sulfur oxides SO ₂ , SO ₃)
Polymerization	Polymerization will not occur.
Incompatibilities	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, sulfides, and carbides.
Corrosivity	Yes

SECTION 11. TOXICOLOGICAL INFORMATION

Routes of Entry	Ingestion. Inhalation. Skin and eye contacts.
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	Not applicable.
Teratogenicity	Not applicable.
Acute toxicity	ORAL (LD50) : 2 140 mg/kg (Rat) ; INHALATION (LC50, 2 hours) : 510 mg/m ³ (Rat) ; 320 mg/m ³ (Mouse). (RTECS).
Acute Effects	May be fatal if inhaled or ingested in large quantity. Liquids or acid mists : May produce tissue damage : Mucous membranes (Eyes, mouth, respiratory tract). Extremely dangerous by eyes and skin contact (Corrosive). Severe irritant for eyes : Inflammation (Redness, watering, itching). Very dangerous in case of inhalation (Mists) at high concentrations : 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 : Possibility of irritation of the nose and throat with sneezing, sore throat or runny nose. Headache, nausea and weakness. Gross overexposure : Possibility of irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath. Pulmonary edema with cough, 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 mists may cause : Corrosion of teeth. Contact (Skin) : Possibility of corrosion, burns or ulcers. Contact with a 1 % solution : Possibility of slight irritation with itching, redness or swelling. Repeated or prolonged exposure (Mist) : Possibility of irritation with itching, burning, redness, swelling or rash.

Contact (Eye) : Possibility of corrosion or ulceration (Blindness may result). Repeated or prolonged exposure (Mist) : Possibility of eye irritation with tearing, pain or blurred vision.

Ingestion : Immediate effects of overexposure : Burns of the mouth, throat, esophagus and stomach, with severe pain, bleeding, vomiting, diarrhea and collapse of blood pressure. Damage may appear days after exposure.

Toxicity

Persons with the following pre-existing conditions warrant particular attention :

Sulfuric (Acid) : Laryngeal irritation.

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

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic toxicity : Slightly to moderately toxic.

Bluegill Sunfish (LC50 ; 48 hours) : 49 mg/l (Tap water, 20 °C, conditions of bioessay not specified). (HSBD).

Flounder (LC50 ; 48 hours) : 100-330 mg/l (Aerated water, conditions of bioessay not specified). (HSBD).

Toxicity to Animals

EYE : Concentrated compound is corrosive. 10 % solution : Moderate eye irritant.

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 oedema. 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 micro-organisms and plants.

Bioaccumulation

Sulfate ion : Ubiquitous in the environment. Metabolized by micro-organisms and plants whitout bioaccumulation.

Biodegradation Products

Not available

Biodegradation Products (Toxicity)

Not applicable

Remarks on Environment

Due to the product's composition, particular attention must be taken for transportation and storage. Protect from rain because the run-off water will become acidic and may be harmful to flora and fauna.

BOD5 and COD

Not available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Cleaned-up material may be an 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.

SECTION 14. TRANSPORT INFORMATION

TDG (Canada)

CLASS 8 Corrosives

PIN

UN1830 SULFURIC ACID PG II

Special Provisions (Transport)

None

DOT (U.S.A.)/IMO (Maritime)

Proper Shipping Name SULFURIC ACID

Hazard Class 8

UN N° 1830

DOT/IMO Label CORROSIVE

Packing Group II

Reportable Quantity 1000 lbs (454 kg)

Shipping Containers Tank Cars, Tank Trucks, Vessel



SECTION 15 REGULATORY INFORMATION

Labeling (EEC)

EU (Directive 67/548/EEC) :

Sulfuric (Acid) : C Corrosive (Pictogram)

Annex I Index number : 016-020-00-8 ; EU Consolidated Inventories : EC Number 231-639-5

C ≥ 15 % C ; R35 ; S2, 26, 30, 45.

Risk Phrases (EEC)

R35- Causes severe burns

R8- Contact with combustible material may cause fire

Safety Phrases (EEC)

S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S30- Nerver add water to this product

S36/37/39- Wear suitable protective clothing, gloves and eye/face protection

S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

CEPA DSL (CANADA)

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) : On the Domestic Substances List (DSL) ; Acceptable for use under the provisions of CEPA.

NorFalco LLC

NorFalco Sales Inc.

77% - 100% SULFURIC ACID

Regulations (U.S.A.)

CERCLA Section 103 Hazardous substances (40 CFR 302.4) ; SARA Section 302 Extremely Hazardous Substances (40 CFR 355) : Yes ; SARA Section 313, Toxic Chemicals (40 CFR 372.65) ; US: TSCA Inventory : Listed :
Sulfuric (Acid) (Final RQ) : 1 000 pounds (454 kg)

Sulfuric Acid is subject to reporting requirements of Section 313, Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), 40 CFR Part 372.

Certain companies must report emissions of Sulfuric Acid as required under The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 40 CFR Part 302

For more information call the SARA Hotline 800-424-9346.

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 : These regulations apply to Sulfuric Acid when being distributed, stored or used for Food or Food Processing.

Classifications HCS (U.S.A.)

Dangerous may cause cancer
Corrosive liquid

NFPA (National Fire Protection Association) (U.S.A.)

Fire Hazard 0 **Reactivity** 2 **Health** 3 **Special Hazard** ACID

NPCA- HMIS Rating

Fire Hazard 0 **Reactivity** 2 **Health** 3

SECTION 16. OTHER INFORMATION

References

- TLVs and BEIs (2007). Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices. ACGIH, Cincinnati, OH – <http://www.acgih.org>
- CCOHS (2007) - Canadian Centre for Occupational Health and Safety - <http://www.ccohs.ca/>
- CSST (2007) - Commission de la Santé et de la Sécurité du Travail (Québec). Service du répertoire toxicologique - <http://www.reptox.csst.qc.ca/>
- HSDB (2007) - Hazardous Substances Data Bank. TOXNET® Network of databases on toxicology, hazardous chemicals, and environmental health. NLM Databases & Electronic Resources, U.S. National Library of Medicine, NHI, 8600 Rockville Pike, Bethesda, MD 20894 - <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB>
- IARC - Monographs on the Evaluation of Carcinogenic Risks to Humans (collection) - <http://www-cie.iarc.fr/>
- Merck Index (1999). Merck & CO., Inc, 12th edition
- NIOSH U.S. (2007) - Pocket Guide to Chemical Hazards - <http://www.cdc.gov/niosh/npgh/>
- North American Emergency Response Guidebook Documents (2004), Developed by the U.S. Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation of Mexico
- Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition
- Règlement sur les produits contrôlés (Canada)
- RTECS (2007). Registry of Toxic Effects of Chemical Substances, NIOSH, CDC
- Toxicologie industrielle & intoxication professionnelle, 3e édition, Lauwerys

Glossary

CSST : Commission de la Santé et de la Sécurité du Travail (Québec).
HSDB : Hazardous Substances Data Bank.
IARC : International Agency for Research on Cancer.
NIOSH : National Institute of Occupational Safety and Health.
NTP : U.S. National Toxicology Program.
RTECS : Registry of Toxic Effects of Chemical Substances

Note

For further information, see NorFalco LLC Sulfuric Acid « Storage and Handling Bulletin ».

Because of its corrosive characteristics and inherent hazards, Sulfuric Acid should not be used in sewer or drain cleaners or any similar application; regardless of whether they are formulated for residential, commercial or industrial use. NorFalco will not knowingly sell sulfuric acid to individuals or companies who repackage the product for sale as sewer or drain cleaners, or any other similar use.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Written by : Groupe STEM Consultants / NorFalco Sales Inc.

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Verified by : Guy Desgagnés, Technical Representative

Request to : André Auger, Administration Assistant Tel. : (905) 542-6901 extension 0 Fax : (905) 542-6914 / 6924
NorFalco Sales Inc., 6755 Mississauga Road, Suite 304, Mississauga, Ontario L5N 2Y7

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