

WHMIS (Classification)

CLASS D-1A : Very toxic material causing immediate and serious effects  
CLASS E : Corrosive material

WHMIS (Pictograms)



SECTION 1. CHEMICAL PRODUCT AND COMPANY 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)  
**DSL (Domestic Substance List)** Listed  
**Name / Chemical Formula** Sulfuric Acid / H<sub>2</sub>SO<sub>4</sub>  
**Chemical Family** Acid  
**Utilization** Chemical industries  
**Manufacturers** CEZinc on behalf of Noranda Income Limited Partnership, Salaberry-de-Valleyfield (Quebec) Canada J6S 4W2  
 Falconbridge Limited, Horne Smelter, Rouyn-Noranda (Quebec) J9X 5B6  
 Falconbridge Limited, Brunswick Smelting Division, Belledune, New Brunswick E0B 1G0  
 Falconbridge Limited, Kidd Creek Division, Timmins, Ontario P4N 7K1  
 Falconbridge Limited, Sudbury Operations, Falconbridge, Ontario P0M 1S0

SECTION 2. COMPOSITION AND INFORMATION ON INGREDIENTS

| Name              | CAS #     | Percentage (%) | Exposure Limits                                     |   |
|-------------------|-----------|----------------|---|---|
|                   |           |                | ACGIH (U.S.A.) 2005<br>TLV-TWA (mg/m <sup>3</sup> ) | OSHA (U.S.A.)<br>PEL - TWA (mg/m <sup>3</sup> ) |
| Sulfuric (Acid)   | 7664-93-9 | 77 % to 100 %  | 0.2 (thoracic fr.)                                  | 1   |
| 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           | 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/m<sup>3</sup> ; IDLH : 15 mg/m<sup>3</sup>.  
 ORAL acute (LD50) : 2 140 mg/kg (Rat) ; INHALATION (LC50, 2 hours) : 510 mg/m<sup>3</sup> (Rat) ; 320 mg/m<sup>3</sup> (Mouse). (RTECS).  
 Consult local authorities for acceptable exposure limits.

SECTION 3. RISK IDENTIFICATION FOR HUMAN HEALTH

**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 Effects** **Sulfuric (Acid)** : 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).

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 AND EXPLOSION DATA

#### 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 (Vacuum trucks, tanks). Follow appropriate National Fire Protection Association (NFPA) codes.

#### Fire Fighting (Instructions)

Use media appropriate for surrounding material. Use water spray to cool containers exposed to fire ; **DO NOT** get water inside containers.

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.

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.

#### Personal Protection

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 / ENGINEERING CONTROLS AND PERSONAL PROTECTION

#### 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.

#### Storage

Keep container tightly closed and closure up (Drum) to prevent leakage. **DO NOT** add water to contents while in container because of violent reaction. Keep out of sun and away from heat, sparks, and flame.

Loosen closure carefully. Relieve internal pressure when received and at least weekly thereafter. **DO NOT** use pressure to empty. Be sure closure is securely fastened before moving container. **DO NOT** wash out container or use it for other purposes ; Replace closure after each withdrawal and return it with empty container.

### SECTION 8. ENGINEERING CONTROLS AND PERSONAL PROTECTION

#### Engineering Controls

Good general ventilation should be provided to keep vapour and mist concentrations below the exposure limits.

#### Personal 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.



## 77% - 100% SULFURIC ACID

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

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

|                                  |  |
|----------------------------------|--|
| <b>Stability</b>                 | Yes  |
| <b>Conditions of Instability</b> | Reacts violently with water and organic materials with evolution of heat.  |
| <b>Polymerization</b>            | Polymerization will not occur.   |
| <b>Incompatibilities</b>         | 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. |
| <b>Corrosivity</b>               | Yes  |

### SECTION 11. TOXICOLOGICAL INFORMATION

|                        |   |
|------------------------|---|
| <b>Chronic Effects</b> | <b>Sulfuric (Acid) :</b> 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.<br><b>Mists :</b> 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.<br><b>Contact (Skin) :</b> 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.<br><b>Contact (Eye) :</b> Possibility of corrosion or ulceration (Blindness may result). Repeated or prolonged exposure (Mist) : Possibility of eye irritation with tearing, pain or blurred vision.<br><b>Ingestion :</b> Immediate effects of overexposure may include : 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. |
| <b>Toxicity</b>        | Persons with the following pre-existing conditions warrant particular attention :<br><b>Sulfuric (Acid) :</b> Laryngeal irritation.<br><i>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.</i>   |

### SECTION 12. ECOTOXICOLOGICAL INFORMATION

|                            |  |
|----------------------------|--|
| <b>Ecotoxicity</b>         | <b>Aquatic toxicity :</b> Slightly to moderately toxic.<br>Bluegill Sunfish (LC50 ; 48 hours) : 49 mg/l (Tap water, 20 °C, conditions of bioessay not specified). (HSBD).<br>Flounder (LC50 ; 48 hours) : 100-330 mg/l (Aerated water, conditions of bioessay not specified). (HSBD).  |
| <b>Toxicity to Animals</b> | <b>EYE :</b> Testing indicates this material is corrosive to the eye, when tested undiluted. Testing indicates this material is a moderate eye irritant, when tested as 10 % solution.<br><b>SKIN :</b> The concentrated compound is corrosive. Testing indicates this material is a slight skin irritant, when tested as 10 % solution. |

## 77% - 100% SULFURIC ACID

|   |  |
|---|--|
|   | Single and repeated exposure caused : Irritation of the respiratory tract ; Corrosion of the respiratory tract ; Lung damage ; Labored breathing ; Altered respiratory rate ; Pulmonary oedema. Repeated exposure caused : Altered red blood cell count. |
| <b>Biodegradation Products</b>            | Not available  |
| <b>Biodegradation Products (Toxicity)</b> | Not applicable   |
| <b>Remarks on Environment</b>             | 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.   |
| <b>BOD5 and COD</b>                       | Not available  |

### SECTION 13. DISPOSAL ARRANGEMENTS

|                       |   |
|-----------------------|---|
| <b>Waste Disposal</b> | Cleaned-up material may be an RCRA Hazardous Waste on disposal due to the corrosivity characteristic. <b>DO NOT</b> 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

|                                       |                            |
|---------------------------------------|----------------------------|
| <b>TDG (Pictograms)</b>               | CLASS 8 Corrosives         |
| <b>PIN</b>                            | UN1830 SULFURIC ACID PG II |
| <b>Special Provisions (Transport)</b> | None                       |

### SECTION 15 OTHER REGULATIONS

#### **Other Regulations** **DOT (U.S.A.)/IMO**

|                      |                                |
|----------------------|--------------------------------|
| Proper Shipping Name | SULFURIC ACID                  |
| Hazard Class         | 8                              |
| UN No.               | 1830                           |
| DOT/IMO Label        | CORROSIVE                      |
| Packing Group        | II                             |
| Reportable Quantity  | 1000 lbs (454 kg)              |
| Shipping Containers  | Tank Cars, Tank Trucks, Vessel |



EU (Directive 67/548/EEC) :

**Sulfuric (Acid)** : Annex I Index number : 016-020-00-8 ; EU Consolidated Inventories : EC Number 231639

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

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

**Classifications DSCL (EEC)** R35- Causes severe burns  
R8- Contact with combustible material may cause fire  
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice  
S30- Never 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).

#### **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 (2005). 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 (2005) - Canadian Centre for Occupational Health and Safety - <http://www.ccohs.ca/>
  - CSST (2005) - Commission de la Santé et de la Sécurité du Travail (Québec). Service du répertoire toxicologique - <http://www.reptox.csst.qc.ca/>
  - HSBD (2005) - 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. (2005) - Pocket Guide to Chemical Hazards - <http://www.cdc.gov/niosh/npg/>
  - 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 (2005). 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).  
HSBD : 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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