

MATERIAL SAFETY DATA SHEET**SULPHURIC ACID SOLUTIONS >2N TO <5N**

PRODUCT CODE NUMBER(S): 8829-6, 8832-6, CAL 0151, CAL 0153, CAL 0463

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** Sulphuric acid solutions
>2N to <5N**Chemical Family:** Mineral acid in solution**Chemical Formula:** H₂SO₄ in H₂O**Product Use:** Laboratory reagent**Manufacturer's Name and Address:**

Caledon Laboratories Ltd.

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Georgetown, Ontario L7G 4R9

Telephone No: (905) 877-0101**Fax No:** (905) 877-6666**Emergency Telephone No:** CANUTEC (613) 996-6666**HAZARDOUS INGREDIENTS OF MATERIALS**

Ingredients	%	TLV Units	CAS No.
Sulphuric acid	8-14	1 mg/m ³ (as H ₂ SO ₄)	7664-93-9

PHYSICAL DATA**Physical State:** Liquid**Odour and Appearance:** Clear, colourless liquid**Odour Threshold (ppm):** 1 mg/m³ (detection); 1 to 3 mg/m³ (irritation) Poor warning properties; irritation and detection above TLV.**Vapour Pressure (mm Hg):** 0.3 mm Hg @ 25°C (conc. H₂SO₄)**Vapour Density (Air = 1):** 3.4**Evaporation Rate:** Not available**Boiling Point (°C):** ~110-120°C**Freezing Point (°C):** ~-10-30°C**pH:** 0.3 (1N)**Specific Gravity:** 1.1-1.3**Coefficient of Water/Oil distribution:** Not available**SHIPPING DESCRIPTION****UN:** 1830**T.D.G. Class:** 8**Pkg. Group:** II**REACTIVITY DATA****Chemical Stability:** Stable**Incompatibility with other substances:** Contact with organic materials may cause fire and explosion. Contact with metals may form toxic and flammable sulphur dioxide and hydrogen gases. Reacts vigorously or violently with most metals, bases, oxidizers, reducers, metal carbonates, metal powders, cyanides, sulphides, carbides, oxides, acetylides, hydrides, halogens, perchlorates, acetonitrile, permanganates, acetic acid, organic or combustible materials.**Reactivity:** Avoid high temperatures, incompatible materials, generation of mist or vapour.**Hazardous Decomposition Products:** SO_x, sulphuric acid vapours, flammable hydrogen gas.**FIRE AND EXPLOSION DATA****Flammability:** Non flammable**Extinguishing Media:** Use appropriate media to extinguish the surrounding supporting fire. Use water to cool containers, absorb heat, and disperse vapours. Fight fire from upwind, from a safe distance. Firefighters must wear specialized protective clothing (full body encapsulating chemical resistant suit) and positive-pressure full face-piece self-contained breathing apparatus.**Flash Point (Method Used):** Not applicable**Autoignition Temperature:** Not combustible**Upper Flammable Limit (% by volume):** Not applicable**Lower Flammable Limit (% by volume):** Not applicable**Hazardous Combustion Products:** SO_x, sulphuric acid vapours, flammable hydrogen gas**Sensitivity to Impact:** None identified**Sensitivity to Static discharge:** None identified**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD50:** (oral, rat) 2,140 mg/kg (conc. H₂SO₄)**LC50:** (rat) 510 mg/m³/2h (conc. H₂SO₄)**Effects of Acute Exposure to Product:****Inhaled:** Corrosive. Destructive to tissue of respiratory tract. May cause increased pulmonary resistance, cough, shortness of breath. Severe overexposure can cause severe damage to lungs, pulmonary edema respiratory collapse, and death. Symptoms (shortness of breath, frothy sputum, cyanosis) may be delayed until hours or days after exposure. Even short term exposure, if severe, can result in permanent lung damage.**In contact with skin:** Corrosive. Severity of injury depends on the concentration and duration of exposure. Can cause severe irritation, brownish yellow stains, pain, burns and permanent scarring. Repeated exposure to dilute solutions may cause irritation, redness, pain, drying and cracking of the skin.**In contact with eyes:** Corrosive. Severity of injury depends on concentration and duration of exposure. Can cause severe irritation, swelling, burns and permanent corneal damage, including blindness.**Ingested:** May be fatal if swallowed. Causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and stricture or perforation of the esophagus and stomach lining may occur. Aspiration may occur during ingestion or vomiting, and can cause serious lung damage, pulmonary edema, and death.**Effects of Chronic Exposure to Product:**

Chronic skin exposure to low concentrations can cause dermatitis. Chronic exposure to high concentrations can cause etching of the teeth. Chronic inhalation can cause bronchial hyperactivity.

Carcinogenicity: Mists containing sulphuric acid considered carcinogenic to humans (ACGIH, IARC, NTP). Positive association between development of upper respiratory cancer, especially laryngeal cancer, and exposure to conc. sulphuric acid in workers at a chemical refinery.**Teratogenicity:** Concentrated sulphuric acid has produced embryotoxicity in animal testing.**Reproductive Effects:** No human data. No effects in mice or rabbits**Mutagenicity:** Insufficient information available

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Synergistic Products: None known**PREVENTIVE MEASURES****Engineering Controls:** Corrosion-resistant exhaust ventilation, separate from other ventilation systems.**Respiratory Protection:** Dust/mist mask. Use only in a chemical fumehood. Up to 15 mg/m³: NIOSH/MSHA approved full face-piece chemical cartridge respirator with acid gas cartridges and high-efficiency particulate filter. For higher or unknown concentrations, as in fire or spill conditions, full face-piece supplied-air respirator with auxiliary positive-pressure self-contained breathing apparatus or full face-piece, positive-pressure self-contained breathing apparatus.**Eye Protection:** Chemical goggles and/or face shield**Skin Protection:** Butyl rubber, polyethylene, Teflon™, Viton™, Saranex™, Responder™, Barricade™, CPF3™, 4H™, Trelchem HPS™, Tychem 10000™ gloves. Other impervious clothing, apron, sleeves, coverall, boots sufficient to prevent contact.**Other Personal Protective Equipment:** Safety showers and eye wash fountains in storage and handling area.**Leak and Spill Procedure:** Evacuate area. Eliminate all sources of ignition. Cleanup crew must be thoroughly trained in the hazards of this product and its safe use, and must wear protective respiratory equipment and impervious clothing sufficient to prevent inhalation of mists, fumes or vapours, and contact. Stop the discharge if possible and contain by constructing barriers. Keep away from all combustible materials. Keep from entering sewers or waterways. Absorb on sand or vermiculite and place in closed containers for disposal, reclamation or neutralization. Contaminated absorbent may pose the same hazards as the product; treat with caution. After thorough cleanup, ventilate area and wash site with copious amounts of running water.**Waste Disposal:** Follow all federal, provincial, and local regulations for disposal.**Handling Procedures and Equipment:** CORROSIVE, TOXIC. Persons working with this product must be thoroughly trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. When diluting, always add acid to water, slowly, while stirring carefully. Use the smallest amount possible for the purpose in a designated area with sufficient ventilation. Avoid all contact with liquid or vapours. Keep work area clean and free of any combustible or incompatible materials. Keep away from all sources of heat and ignition. Caution: empty containers may contain hazardous residues; treat with caution.**Storage Requirements:** Store in suitable, labelled containers, in a dry, well-ventilated area out of direct sunlight. Store away from incompatible and combustible materials and all ignition sources. Store at temperatures above freezing. The material attacks many forms of rubber, coatings and plastics, store in appropriate containers that are resistant. Keep tightly closed. Storage area should be constructed of non-combustible materials and have raised sills, with trenching to safe area. Protect from damage, and inspect frequently for signs of damage or leaks.**FIRST AID MEASURES****SPEED IN REMOVING ACID FROM CONTACT WITH TISSUE IS OF PRIMARY IMPORTANCE. DELAY CAN RESULT IN SERIOUS INJURIES.****Specific Measures:****Eyes:** IMMEDIATELY FLUSH EYES with gently running water for at least twenty to thirty (20-30) minutes, holding eyelids open while flushing. Take care not to flush contaminated water into unaffected eye. Wear gloves to prevent contact during first aid procedures. Get medical attention immediately.**Skin:** IMMEDIATELY remove contaminated clothing (including shoes, watches, belts, and rings). Wear protective gloves to avoid contact during first aid procedures. IMMEDIATELY flush the exposed area with running water for at least twenty to thirty (20-30) minutes. Place victim under a deluge shower if the exposure was extensive. Take care to completely clean folds, creases, groin, under fingernails. Obtain medical attention immediately. Discard contaminated clothing, shoes, leather goods.**Inhalation:** IMMEDIATELY remove to fresh air (caution must be used by rescuers to avoid exposure to the contaminating fumes). Give oxygen for breathing difficulty. If breathing has STOPPED give artificial respiration and get medical attention immediately. Avoid contact by using mouth guards or shields. Stay with casualty until medical help arrives. If severe exposure is suspected hospitalization and observation for 72 hours for delayed onset of pulmonary edema is advised.**Ingestion:** DO NOT INDUCE VOMITING. If casualty is alert and not convulsing, rinse mouth with water and give 1 to 2 cups of water or milk to dilute material. IMMEDIATELY OBTAIN MEDICAL ATTENTION. If spontaneous vomiting occurs; have casualty lean forward with head down to avoid breathing in of vomitus. Rinse mouth and administer 1/2 cup of water or milk.**REFERENCES USED**

CCINFO disc: MSDS's, March 2007

Budavari: The Merck Index, 12th ed., 1997

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 3, 1990

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION**Date Issued:** March 17, 1992**Revision:** March 2010**MSDS:** 8829-6, 8832-6, CAL 0151, CAL 0153, CAL 0463**WHMIS Designation:** D1A; D2A; E

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