MSDS

MATERIAL SAFETY DATA SHEET **CHEMTREC:** 800-424-9300 (USA)

703-527-3887(Outside USA an Canada)

CANUTEC:

613-996-6666

From: Mallinckrodt Baker, Inc
222 Red School Lane
Phillipsburg, NJ 08865

NOTE: Use CHEMTREC and CANUTEC phone numbers only in the event of a chemical emergency.

Emergency Telephone Number: 908-859-2151

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

M A L L I N C K R O D T **J. T. B A K E R**

SULFURIC ACID,

1. Product Identification

Synonyms:
Sulfuric acid solution; Sulfuric Acid Volumetric Solutions 2.0 Normal and below

CAS No.: 7664-93-9

Molecular Weight: 98.07

Chemical Formula: H2SO4 in H2O

Product Codes:
J.T. Baker: 4699, 4703, 4704, 5640, 5641, 5642, 5690, 5692, 5693, 5694
Mallinckrodt: 6843, 7610, H366, H372, H381, H389, H392, H641

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	0.1 - 10%	Yes
Water	7732-18-5	90 - 99%	No

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. CANCER HAZARD. STRONG INORGANIC ACID MISTS SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Potential Health Effects

Inhalation:

Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric ac Symptoms may include irritation of the nose and throat, labored breathing, as well as lung edema, d the mucous membranes and upper respiratory tract.

Ingestion:

Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric ac Symptoms may include severe burns of the mouth, throat, and stomach. Circulatory collapse with clam weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. shock is often the immediate cause of death. May cause sore throat, vomiting, diarrhea.

Skin Contact:

Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric ac Symptoms may include redness, pain, and burns to the skin. Circulatory collapse with clammy skin, w rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulato often the immediate cause of death.

Eye Contact:

Corrosive. Effects should be less severe than from exposure to higher concentrations of sulfuric ac Symptoms may include blurred vision, redness, pain, and burns to eye tissue. Concentrated solutions blindness.

Chronic Exposure:

Long term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containin 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 mo susceptible to the effects of the substance.

4. First Aid Measures

First aid procedures given apply to concentrated solutions. Exposures to dilute solutions may not r these extensive first aid procedures.

Inhalation:

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

Ingestion:

DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconsci Call a physician immediately.

Skin Contact:

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

Eye Contact:

Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower
eyelids occasionally. Call a physician immediately.

5. Fire Fighting Measures

Fire:

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

Explosion:

Contact with most metals causes formation of flammable and explosive hydrogen gas.

Fire Extinguishing Media:

Dry chemical, foam, water or carbon dioxide. Concentrated solutions are water reactive.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing a
with full facepiece operated in the pressure demand or other positive pressure mode. Structural fir
protective clothing is ineffective for fires involving this material. Stay away from sealed contain

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Sec
Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover
possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e
vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible mate
as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases t
water and air in excess of reportable quantities. The toll free number for the US Coast Guard Natio
Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB(R) or TEAM(R) 'Low Na+' acid neutralizers are recommended for spills of this

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect
physical damage. Keep out of direct sunlight and away from heat and incompatible materials. Do not
container and use it for other purposes. When diluting, always add the acid to water; never add wat
acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen
present. Protect from freezing. Containers of this material may be hazardous when empty since they
product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Sulfuric Acid:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -
1 mg/m3(TWA), 3 mg/m3 (STEL), A2 - suspected human carcinogen for sulfuric acid contained in strong acid mists.

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

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respi an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times th limit, or the maximum use concentration specified by the appropriate regulatory agency or respirato whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are presen NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are no use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a wr program covering the basic requirements in the OSHA respirator standard. These include training, fi medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for det

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

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

9. Physical and Chemical Properties

Appearance:

Clear, colorless solution.

Odor:
Odorless.

Solubility:
Miscible in water.

Specific Gravity:
ca. 1.0 (0.1%), 1.07 (10%)

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/
% Volatiles by volume @ 21C (70F):
95
Boiling Point:
No information found.
Melting Point:
3C (100%), -32C (93%), -38C (78%), -64C (65%).
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
(The following information applies to concentrated solutions). Toxic fumes of oxides of sulfur when decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with car generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and sulfide respectively.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and agents and many other reactive substances.
Conditions to Avoid:
Heat, incompatibles.

11. Toxicological Information

Toxicological Data:
Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m3/2H; standard Draize, eye rabbit, 250 ug (investigated as a tumorigen, mutagen, reproductive effector.
Carcinogenicity:
Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorga

mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

--------\Cancer Lists\----------

	---NTP Carcinogen---		
Ingredient	Known	Anticipated	IARC Category
Sulfuric Acid (7664-93-9)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into the air, material may be removed from the atmosphere to a moderate extent by wet deposition. When released i air, this material may be removed from the atmosphere to a moderate extent by dry deposition.

Environmental Toxicity:

LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt wate /Conditions of bioassay not specified.

This material may be toxic to aquatic life.

13. Disposal Considerations

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

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SULFURIC ACID (WITH NOT MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN2796
Packing Group: II
Information reported for product/size: 20L
International (Water, I.M.O.)

Proper Shipping Name: SULPHURIC ACID (WITH NOT MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN2796
Packing Group: II
Information reported for product/size: 20L

--------\Chemical Inventory Status - Part 1\--------------------------------

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------------------------------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

		-RCRA-	-TSCA-
Ingredient	CERCLA	261.33	8(d)
Sulfuric Acid (7664-93-9)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes

SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No

Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2R
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations
the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**
Label Hazard Warning:

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED
CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. CANCER HAZARD. STRONG INORGANIC ACID MISTS
SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:

Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

Label First Aid:

In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with
water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before
Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT
VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If
remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 654-1600 (U.S.A.)