Mallinckrodt Baker

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	SULFURIC ACID
Version #	06
Revision date	06-25-2010
CAS #	Mixture
Product Codes	J.T.Baker: 5030, 5137, 5374, 5802, 5815, 5858, 5859, 5868, 5889, 5897, 5971, 5997, 6163, 6902, 9671, 9673, 9674, 9675, 9681, 9684, 9690, 9691, 9697, 9864, IM2876 Mallinckrodt: 2876, 2877, 2878, 2879, 2900, 2904, 3780, 5557, H644, H976, H996, V651
Synonym(s)	Oil of vitriol * Babcock acid * Sulphuric acid
Manufacturer	Mallinckrodt Baker, Inc.
Address	222 Red School Lane Phillipsburg, NJ 08865 US
Customer Service	800-582-2537
24 Hour Emergency	908-859-2151
Chemtrec	800-424-9300

2. Hazards Identification

Emergency overview	DANGER Poison Material reacts with water. Corrosive. Causes severe skin and eye burns. May be fatal if swallowed. Harmful if inhaled. Cancer hazard. Prolonged exposure may cause chronic effects. Harmful if absorbed through skin.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Corrosive to the eyes and may cause severe damage including blindness. Causes eye burns. This product may cause severe irritation, redness, or blurred vision. Do not get this material in contact with eyes.
Skin	Corrosive. Causes severe skin burns. Do not get this material in contact with skin.
Inhalation	Corrosive. Causes burns. May cause damage to mucous membranes in nose, throat, lungs and bronchial system. Inhalation of vapor or mist may cause lung edema. May cause cancer by inhalation. Prolonged inhalation may be harmful. Do not breathe dust/fume/gas/mist/vapors/spray.
Ingestion	Corrosive. May be fatal if swallowed. Components of the product may be absorbed into the body by ingestion. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. May irritate and cause stomach pain, vomiting and diarrhoea. Do not ingest.
Target organs	Eyes. RESPIRATORY SYSTEM. Skin. Teeth.
Signs and symptoms	Irritation of nose and throat. Irritation of eyes and mucous membranes.
Potential environmental effects	Components of this product are hazardous to aquatic life. May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
SULFURIC ACID	7664-93-9	90 - 100
Other components below reportable levels		> 2.5

4. First Aid Measures

First aid procedures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Skin contact Immediately flush skin with plenty of water. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse. Get medical attention immediately.

Inhalation Move to fresh air. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician or poison control center immediately.

Ingestion Do not induce vomiting without advice from poison control center. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth thoroughly. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

General advice Immediate medical attention is required. IF exposed or concerned: Get medical advice/attention. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties Not flammable, but reacts with most metals to form flammable hydrogen gas. Substance will react with water releasing flammable, toxic or corrosive gases and runoff.

Extinguishing media

Suitable extinguishing media Foam. Dry powder. Carbon dioxide (CO2). Do not use water as an extinguisher. Water spray should be used to cool containers.

Unsuitable extinguishing media Water.

Protection of firefighters

Specific hazards arising from the chemical Water reactive material.

Protective equipment and precautions for firefighters As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Hazardous combustion products May include oxides of sulphur.

6. Accidental Release Measures

Personal precautions Ventilate the area. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water.

Methods for containment Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up

Should not be released into the environment.

Large Spills: Dike far ahead of spill for later disposal. Neutralize spilled material with crushed limestone, soda ash or lime. Absorb in vermiculite, dry sand or earth and place into containers. DO NOT use combustible materials such as sawdust.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece).

Never return spills in original containers for re-use. Clean surface thoroughly to remove residual contamination.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Handling

Do not get this material in contact with eyes. Do not get this material in contact with skin. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not get this material on clothing. Do not use in areas without adequate ventilation. Wear personal protective equipment. Avoid prolonged exposure. Wash thoroughly after handling. Use caution when combining with water; DO NOT add water to acid, ALWAYS add acid to water while stirring to prevent release of heat, steam and fumes.

Storage

Store in appropriate chemical storage area. Store in a well-ventilated place. Keep container tightly closed. Keep container dry. Do not store near heat sources or expose to high temperatures. Protect against direct sunlight. Keep out of the reach of children. Keep away from food, drink and animal feedingstuffs.

8. Exposure Controls / Personal Protection

Occupational exposure limits

ACGIH

Components	Type	Value	Form
SULFURIC ACID (7664-93-9)	TWA	0.2000 mg/m3	Thoracic fraction.

U.S. - OSHA

Components	Type	Value
SULFURIC ACID (7664-93-9)	PEL	1.0000 mg/m3
	TWA	1.0000 mg/m3

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection

Do not get in eyes. Chemical goggles are recommended. Use face shield in case of splash risk. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin protection

In case of splashes: Wear apron or special protective clothing.Impervious gloves. Do not get this material in contact with skin. Do not get this material on clothing.

Respiratory protection

If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection. Chemical respirator with acid gas cartridge. WARNING! Air-purifying respirators do not protect workers in oxygen deficient atmospheres. Do not breathe dust/fume/gas/mist/vapors/spray.

General hygeine considerations

Do not get in eyes. Do not get this material in contact with skin. Do not get this material on clothing. When using, do not eat, drink or smoke. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.

General

Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations.

9. Physical & Chemical Properties

Appearance	Aqueous solution.
Color	Clear.
Odor	Odorless.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	1 N solution (~5% w/w) = 0.3; 0.1 N solution (~0.5% w/w) = 1.2
Melting point	3°C (100%), -32°C (93%), -38°C (78%), -64°C (65%).
Freezing point	Not available.
Boiling point	537.8 °F (281 °C) estimated
Flash point	Not available.
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor pressure	0 hPa estimated
Vapor density	3.4
Specific gravity	1.84 (98%), 1.40 (50%), 1.07 (10%)
Relative density	Not available.
Solubility (water)	Miscible.
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not available.
Decomposition temperature	644 °F (340 °C)
Percent volatile	5 % estimated
Molecular formula	H_2SO_4 in H_2O

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions. Material reacts with water.
Conditions to avoid	Moisture. Heat.
Incompatible materials	Water. Cyanides. Strong oxidizing agents. Strong reducing agents. Metals. Halogens. Potassium Organic compounds. May be corrosive to metals.
Hazardous decomposition products	Sulphur oxides. Irritating and/or toxic fumes and gases may be emitted upon the products decomposition.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product	**Test Results**
SULFURIC ACID (Mixture)	Acute Inhalation LC50 Guinea pig: 0.0253 mg/l estimated
	Acute Inhalation LC50 Rat: 365 mg/l estimated
Components	**Test Results**
SULFURIC ACID (7664-93-9)	Acute Inhalation LC50 Rat: 347 mg/l 1.00 Hours

Components	Test Results
SULFURIC ACID (7664-93-9)	Acute Oral LD50 Rat: 2140 mg/kg

* Estimates for product may be based on additional component data not shown.

Acute effects Causes burns.

Chronic effects Hazardous by OSHA criteria. Prolonged exposure may cause chronic effects.

Carcinogenicity Hazardous by OSHA criteria. Risk of cancer cannot be excluded with prolonged exposure.

ACGIH Carcinogens

SULFURIC ACID (CAS 7664-93-9)	A2 Suspected human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

SULFURIC ACID (CAS 7664-93-9)	1 Carcinogenic to humans.

US NTP Report on Carcinogens: Known carcinogen

SULFURIC ACID (CAS 7664-93-9)	Known carcinogen.

Skin corrosion/irritation Hazardous by OSHA criteria.

Epidemiology Not available.

Neurological effects Not available.

12. Ecological Information

Ecotoxicological data

Product	Test Results
SULFURIC ACID (Mixture)	LC50 Fish: 44.21 mg/l 96.00 Hours estimated

Components	Test Results
SULFURIC ACID (7664-93-9)	LC50 Western mosquitofish (Gambusia affinis): 42 mg/l 96.00 Hours

* Estimates for product may be based on additional component data not shown.

Ecotoxicity Components of this product are hazardous to aquatic life.

Environmental effects Harmful to aquatic organisms.

Persistence and degradability Not available.

13. Disposal Considerations

Waste codes D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]

Disposal instructions All wastes must be handled in accordance with local, state and federal regulations. Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose in accordance with all applicable regulations.

Contaminated packaging Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Basic shipping requirements:

UN number UN1830

Proper shipping name Sulfuric acid with more than 51% acid

Hazard class 8

Packing group II

Additional information:

Special provisions A3, A7, B3, B83, B84, IB2, N34, T8, TP2, TP12

Packaging exceptions 154

Packaging non bulk	202
Packaging bulk	242
ERG number	137

IATA

Basic shipping requirements:

UN number	1830
Proper shipping name	Sulphuric acid with more than 51% acid
Hazard class	8
Subsidiary hazard class	4.3
Packing group	II

IMDG

Basic shipping requirements:

UN number	1830
Proper shipping name	SULPHURIC ACID with more than 51% acid
Hazard class	8
Subsidiary hazard class	4.3
Packing group	II

DOT

IATA

IMDG

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Spill: Reportable quantity

SULFURIC ACID (CAS 7664-93-9)	1000 LBS

US EPCRA (SARA Title III) Section 302 - Extremely Hazardous Substance: Threshold Planning Quantity

SULFURIC ACID (CAS 7664-93-9)	1000 LBS

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

SULFURIC ACID (CAS 7664-93-9)	1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

SULFURIC ACID (CAS 7664-93-9)	Listed.

CERCLA (Superfund) reportable quantity

SULFURIC ACID: 1000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - Yes
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

SULFURIC ACID (CAS 7664-93-9) Listed.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

SULFURIC ACID (CAS 7664-93-9) Listed: March 14, 2003 Carcinogenic.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

SULFURIC ACID (CAS 7664-93-9) 500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

SULFURIC ACID (CAS 7664-93-9) Listed.

Saf-T-Data

Health: 4 - Extreme (Poison)
Flammability: 0 - None
Reactivity: 2 - Moderate
Contact: 4 - Extreme (Corrosive)
Lab Protective Equip: D - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: W - White (Corrosive)

16. Labeling Info

Label Hazard Warning

DANGER -- POISON
Material reacts with water.
Corrosive. Causes severe skin and eye burns. May be fatal if swallowed. Harmful if inhaled. Cancer hazard. Prolonged exposure may cause chronic effects. Harmful if absorbed through skin.

Label Precautions

Do not get in eyes, on skin, or on clothing. Do not breathe mist or vapor. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. DO NOT allow water to come into contact with this material.

Label First Aid

Immediately flush eyes with plenty of water for at least 15 minutes. Immediately flush skin with plenty of water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. If the affected person is not breathing, apply artificial respiration. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. Get medical attention immediately.

17. Other Information

NFPA ratings

Health: 3
Flammability: 0
Instability: 1
Special hazards: W

Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Issue date

06-25-2010