



Be Right™

SAFETY DATA SHEET

This safety data sheet complies with the requirements of:
SS586: 2008 (2014)

Issue Date 21-Apr-2016

Revision Date 27-Feb-2017

Version 2

Section 1: IDENTIFICATION

Product identifier

Product Name COD TNTPlus™, LR (3-150 MG/L)

Other means of identification

Product Code(s) TNT821

Proper shipping name Sulphuric Acid

Safety data sheet number M03407

Raw Material/Pure Substance Mixture

Contains Sulfuric acid

Recommended use of the chemical and restrictions on use

Recommended Use No information available.

Uses advised against No information available

Details of the supplier of the safety data sheet

Manufacturer

HACH SEA Headquarters

1 Science Park Road, #05-09, East Wing, The Capricorn, Singapore Science Park II, Singapore 117528

Emergency telephone number

Chemtrec 1-800-424-9300

Section 2: HAZARDS IDENTIFICATION

GHS - Classification

Corrosive to metals	Category 1
Acute toxicity - Oral	Category 4
Acute toxicity - Dermal	Category 3
Skin corrosion/irritation	Category 1
Specific target organ toxicity (repeated exposure)	Category 2
Aquatic Acute Toxicity	Category 1
Chronic aquatic toxicity	Category 1

Label elements

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Signal word - Danger

Hazard statements

H290 - May be corrosive to metals
H302 - Harmful if swallowed
H311 - Toxic in contact with skin
H314 - Causes severe skin burns and eye damage
H373 - May cause damage to organs through prolonged or repeated exposure
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements

P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P273 - Avoid release to the environment
P234 - Keep only in original container
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P310 - Immediately call a POISON CENTER or doctor
P391 - Collect spillage
P390 - Absorb spillage to prevent material damage
P405 - Store locked up
P406 - Store in corrosive resistant stainless steel container with a resistant inliner
P501 - Dispose of contents/ container to an approved waste disposal plant

Contains Chromium trioxide EUH208 - May produce an allergic reaction

Other hazards

No information available

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

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Chemical Name	Formula	EC No	CAS No	Percent Range
Sulfuric acid	H ₂ SO ₄	231-639-5	7664-93-9	80 - 90%
Mercuric sulfate	HgSO ₄	231-992-5	7783-35-9	0.1 - 1%
Sulfuric acid, disilver(1+) salt	Ag ₂ SO ₄	233-653-7	10294-26-5	0.1 - 1%
Chromium trioxide	CrO ₃	215-607-8	1333-82-0	<0.1%

Section 4: FIRST AID MEASURES

Description of first aid measures

General advice

See section 8 for PPE that may be required during handling

Do not breathe dust/fume/gas/mist/vapors/spray

Do not get in eyes, on skin, or on clothing

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible)

If no local exhaust use approved fume hood and/or respirator

If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician

Remove from exposure, lie down

Immediate medical attention is required

IF IN EYES: Flush eyes for at least 15 minutes

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Inhalation

IF INHALED: Remove person to fresh air and keep comfortable for breathing

Call a physician immediately

Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

Call a physician immediately

Skin contact

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Call a physician immediately

Ingestion

IF SWALLOWED: Rinse Mouth

Do NOT induce vomiting

Call a physician immediately

Most important symptoms and effects, both acute and delayed

Symptoms

See Section 11: TOXICOLOGICAL INFORMATION

For emergency responders

Self-protection of the first aider

First aider: Pay attention to self-protection

Use personal protective equipment as required

Avoid contact with skin, eyes or clothing

Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination

Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device

Indication of any immediate medical attention and special treatment needed

Note to physicians

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Treat symptomatically

Section 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

Unsuitable extinguishing media

Caution: Use of water spray when fighting fire may be inefficient

5.2. Special hazards arising from the substance or mixture

The product causes burns of eyes, skin and mucous membranes
Thermal decomposition can lead to release of irritating and toxic gases and vapors
In the event of fire and/or explosion do not breathe fumes

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective suit
Use personal protective equipment as required

Section 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas
Do not touch or walk through spilled material
Ventilate affected area
Use personal protective equipment as required

For emergency responders

Use personal protection recommended in Section 8

Environmental precautions

Do not allow into any sewer, on the ground or into any body of water
Should not be released into the environment
Prevent further leakage or spillage if safe to do so
Prevent product from entering drains
See Section 12 for additional ecological information

Methods and material for containment and cleaning up

Prevent further leakage or spillage if safe to do so
Dike far ahead of liquid spill for later disposal
Take necessary precautions in observance of pertinent physical hazards
Neutralize spill if necessary
Soak up with inert absorbent material
Take up mechanically, placing in appropriate containers for disposal
Clean contaminated surface thoroughly
Dispose of in accordance with local, state and federal regulations or laws.

Prevention of secondary hazards

Clean contaminated objects and areas thoroughly observing environmental regulations

Reference to other sections

See section 8 for more information
See section 13 for more information

Section 7: HANDLING AND STORAGE

Precautions for safe handling

Absorb spillage to prevent material damage.

General Hygiene Considerations

Avoid breathing (dust, vapor, mist, gas)
 Avoid contact with skin, eyes or clothing
 Use personal protective equipment as required
 Wear suitable gloves and eye/face protection
 Wash face, hands and any exposed skin thoroughly after handling
 Do not eat, drink or smoke when using this product
 Keep away from food, drink and animal feeding stuffs
 Regular cleaning of equipment, work area and clothing is recommended
 Handle in accordance with good industrial hygiene and safety practice
 Avoid prolonged or repeated contact with skin
 Take off all contaminated clothing and wash it before reuse

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Keep/store only in original container.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational exposure limits

Chemical Name	Singapore	OSHA PEL	ACGIH TLV	NIOSH IDLH
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	PEL: 1 mg/m ³ STEL: 3 mg/m ³	TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³	TWA: 0.2 mg/m ³	IDLH: 15 mg/m ³ TWA: 1 mg/m ³
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	PEL: 0.025 mg/m ³	(vacated) Ceiling: 0.1 mg/m ³	TWA: 0.025 mg/m ³ S*	IDLH: 10 mg/m ³ Hg Ceiling: 0.1 mg/m ³ Hg TWA: 0.05 mg/m ³ except Organo alkyls Hg vapor
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	PEL: 0.01 mg/m ³	TWA: 0.01 mg/m ³ (vacated) TWA: 0.01 mg/m ³	TWA: 0.01 mg/m ³	IDLH: 10 mg/m ³ Ag TWA: 0.01 mg/m ³ Ag
Chromium trioxide (<0.1%) CAS#: 1333-82-0	PEL: 0.05 mg/m ³	TWA: 5 µg/m ³ (vacated) Ceiling: 0.1 mg/m ³ Ceiling: 0.1 mg/m ³	TWA: 0.05 mg/m ³	IDLH: 15 mg/m ³ Cr(VI) TWA: 0.0002 mg/m ³ Cr

Biological occupational exposure limits

Chemical Name	CAS No	Singapore
Sulfuric acid 80 - 90%	7664-93-9	NDF
Mercuric sulfate 0.1 - 1%	7783-35-9	50 µg/L
Sulfuric acid, disilver(1+) salt 0.1 - 1%	10294-26-5	NDF
Chromium trioxide <0.1%	1333-82-0	NDF

Legend

See section 16 for terms and abbreviations

Appropriate engineering controls

If no local exhaust use approved fume hood or self-contained breathing apparatus. If no local exhaust use approved fume hood and/or respirator. Showers. Eyewash stations.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear tight sealing safety goggles and/or face protection shield
Avoid contact with eyes

Skin and body protection

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact

Respiratory protection

Do not breathe gas/fumes/vapor/spray
If no local exhaust use approved fume hood and/or respirator
In case of inadequate ventilation wear respiratory protection

Environmental exposure controls

Do not allow into any sewer, on the ground or into any body of water
Local authorities should be advised if significant spillages cannot be contained

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid		
Gas Under Pressure	Not classified according to GHS criteria		
Appearance	Turbid solution	Color	light orange
Odor	Odorless	Odor threshold	Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
Molecular weight	No data available	
pH	< 0.5	
Melting point/freezing point	4 °C / 39 °F	
Boiling point / boiling range	~ 102 °C / 216 °F	Estimation based on theoretical calculation
Evaporation rate	0.16 (water = 1)	Estimation based on theoretical calculation
Vapor pressure	1.8 mm Hg / 0.24 kPa at 25 °C / 77 °F	Estimation based on theoretical calculation
Vapor density (air = 1)	0.03 (air = 1)	

Specific gravity (water = 1 / air = 1) 1.78
 Partition Coefficient (n-octanol/water) Not applicable
 Soil Organic Carbon-Water Partition Coefficient Not applicable
 Autoignition temperature No data available
 Decomposition temperature No data available
 Dynamic viscosity ~ 2.499 cP (mPa s) at 20 °C / 68 °F
 Kinematic viscosity ~ 1.404 cSt (mm²/s) at 20 °C / 68 °F

Solubility(ies)

Water solubility

<u>Water solubility classification</u>	<u>Water solubility</u>	<u>Water Solubility Temperature</u>
Soluble	> 1000 mg/L	25 °C / 77 °F

Solubility in other solvents

<u>Chemical Name</u>	<u>Solubility classification</u>	<u>Solubility</u>	<u>Solubility Temperature</u>
None reported	No information available	No data available	No information available

Particle Size No information available

Particle Size Distribution No information available

Other Information

Metal Corrosivity Classified as corrosive to metal according to GHS criteria

GHS Metal Corrosivity Classification Category 1, H290

Steel Corrosion Rate 4.88 mm/yr / 0.19 in/yr

Aluminum Corrosion Rate 55.4 mm/yr / 2.18 in/yr

Bulk density Not applicable

Explosive properties Not classified according to GHS criteria.

Explosion data No data available

Upper explosion limit No data available

Lower explosion limit No data available

Flammable properties Not classified as flammable according to GHS criteria.

Flammability Limit in Air

Upper flammability limit: No data available

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Lower flammability limit: No data available

Flash point No data available

Oxidizing properties Not classified according to GHS criteria.

Reactivity properties Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

Section 10: STABILITY AND REACTIVITY

Reactivity

Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria

Chemical stability

Stable under normal conditions

Explosion data

Sensitivity to Mechanical Impact

None reported

Sensitivity to Static Discharge

None reported

Possibility of Hazardous Reactions

None under normal processing

Hazardous polymerization does not occur

Conditions to avoid

Heat, flames and sparks

Poor Ventilation

Contact with oxidizers

Incompatibles

Incompatible materials

Strong oxidizing agents

Strong acids

Strong bases

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors

Section 11: TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information	Toxic in contact with skin. Corrosive to skin. Corrosive to eyes. Harmful if swallowed.
Inhalation	Causes burns. Corrosive by inhalation.
Eye contact	Corrosive to the eyes and may cause severe damage including blindness. Causes burns.
Skin contact	Toxic in contact with skin. Cause severe skin burns and eye damage. Causes burns.
Ingestion	Ingestion causes burns of the upper digestive and respiratory

	tracts. Harmful if swallowed. Causes burns.
Aggravated Medical Conditions	Eye disorders. Skin disorders. Respiratory disorders.
Toxicologically synergistic products	None known.
Toxicokinetics, metabolism and distribution	See ingredients information below.

Chemical Name	Toxicokinetics, metabolism and distribution
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	The corrosivity of sulfuric acid makes it difficult to assess its effects on metabolism. Its corrosivity is also the main contributor to acute deaths, therefore it is not classified for acute toxicity.
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	Central nervous system is the most sensitive target for mercury exposure.
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Water soluble Cr VI is mutagenic in vitro.

Product Acute Toxicity Data

Oral Exposure Route	No data available
Dermal Exposure Route	No data available
Inhalation (Dust/Mist) Exposure Route	No data available
Inhalation (Vapor) Exposure Route	No data available
Inhalation (Gas) Exposure Route	No data available
Unknown acute toxicity	0% of the mixture consists of ingredient(s) of unknown toxicity
ATEmix (oral)	637.40
ATEmix (dermal)	636.00
ATEmix (inhalation-dust/mist)	6.37

Ingredient Acute Toxicity Data

Oral Exposure Route				If available, see data below	
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	Rat LD ₅₀	> 5000 mg/kg	None reported	None reported	Vendor SDS
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Rat LD ₅₀	52 mg/kg	None reported	None reported	ERMA (New Zealand's Environmental Risk Management Authority)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Rat LD ₅₀	2140 mg/kg	None reported	None reported	IUCLID (The International Uniform Chemical Information Database)
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	Mouse LD ₅₀	25 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route				If available, see data below	
Chemical Name	Endpoint	Reported	Exposure	Toxicological effects	Key literature references and

	type	dose	time		sources for data
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Rat LD ₅₀	55 mg/kg	None reported	None reported	ERMA (New Zealand's Environmental Risk Management Authority)
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	Rat LD ₅₀	625 mg/kg	None reported	None reported	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Dust/Mist) Exposure Route

If available, see data below

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Rat LC ₅₀	0.217 mg/L	4 hours	None reported	ERMA (New Zealand's Environmental Risk Management Authority)

Inhalation (Vapor) Exposure Route

If available, see data below

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Rat LC ₅₀	0.510 mg/L	None reported	None reported	LOLI
Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Human TD _{Lo}	0.144 mg/L	5 minutes	Lungs, Thorax, or Respiration Dyspnea	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route

No data available

Product Skin Corrosion/Irritation Data

No data available.

Ingredient Skin Corrosion/Irritation Data

If available, see data below

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to skin	HSDB (Hazardous Substances Data Bank)
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	Existing human experience	Human	None reported	None reported	Skin irritant	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	Standard Draize Test	Rabbit	500 mg	4 hours	Not corrosive or irritating to skin	ECHA (The European Chemicals Agency)
Chromium trioxide (<0.1%) CAS#: 1333-82-0	United States Department of Transportation	Rabbit	500 mg	30 minutes	Corrosive to skin	ECHA (The European Chemicals Agency)

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	(DOT) Skin Corrosion Test					
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Product Serious Eye Damage/Eye Irritation Data

No data available.

Ingredient Eye Damage/Eye Irritation Data

If available, see data below

Chemical Name	Test method	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Existing human experience	Human	None reported	None reported	Corrosive to eyes	HSDB (Hazardous Substances Data Bank)
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	Existing human experience	Human	None reported	None reported	Eye irritant	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	Standard Draize Test	Rabbit	180 mg	None reported	Corrosive to eyes	ECHA (The European Chemicals Agency)
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Existing human experience	Human	None reported	None reported	Corrosive to eyes	ERMA (New Zealand Environmental Risk Management Authority)

Sensitization Information

Product Sensitization Data

Skin Sensitization Exposure Route No data available.

Respiratory Sensitization Exposure Route No data available.

Ingredient Sensitization Data

Skin Sensitization Exposure Route No data available.

Respiratory Sensitization Exposure Route No data available.

Chronic Toxicity Information

Product Repeat Dose Toxicity Data

Oral Exposure Route No data available.

Dermal Exposure Route No data available.

Inhalation (Dust/Mist) Exposure Route No data available.

Inhalation (Vapor) Exposure Route No data available.

Inhalation (Gas) Exposure Route No data available.

Ingredient Repeat Dose Toxicity Data

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route If available, see data below

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Human TC _{Lo}	.003 mg/L	168 days	Musculoskeletal Changes in teeth and supporting structures	RTECS (Registry of Toxic Effects of Chemical Substances)

Inhalation (Gas) Exposure Route No data available

Chemical Name	CAS No	ACGIH	IARC	NTP	OSHA
Sulfuric acid	7664-93-9	A2	Group 1	Known	X
Mercuric sulfate	7783-35-9	-	Group 3	-	-
Sulfuric acid, disilver(1+) salt	10294-26-5	-	-	-	-
Chromium trioxide	1333-82-0	A1	Group 1	Known	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)	A2 - Suspected Human Carcinogen
IARC (International Agency for Research on Cancer)	Group 1 - Carcinogenic to Humans Group 3 - Not classifiable as a human carcinogen
NTP (National Toxicology Program)	Known - Known Carcinogen
OSHA (Occupational Safety and Health Administration of the US Department of Labor)	X - Present

Product Carcinogenicity Data No data available

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route No data available

Inhalation (Gas) Exposure Route No data available

Ingredient Carcinogenicity Data

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route No data available

Inhalation (Gas) Exposure Route No data available

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Product Germ Cell Mutagenicity *in vitro* Data

No data available.

Ingredient Germ Cell Mutagenicity *in vitro* Data

If available, see data below

Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Cytogenetic analysis	Hamster ovary	4 mmol/L	None reported	Positive test result for mutagenicity	OECD (Organization for Economic Co-operation and Development)
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Morphological transformation	Human fibroblast	100 nmol/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)
Chemical Name	Test	Cell Strain	Reported dose	Exposure time	Results	Key literature references and sources for data
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Cytogenetic analysis	Human leukocyte	2 mg/L	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Oral Exposure Route

No data available

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

Ingredient Germ Cell Mutagenicity *in vivo* Data

Oral Exposure Route

If available, see data below

Chemical Name	Test	Species	Reported dose	Exposure time	Results	Key literature references and sources for data
Chromium trioxide (<0.1%) CAS#: 1333-82-0	Cytogenetic analysis	Mouse	20 mg/kg	None reported	Positive test result for mutagenicity	RTECS (Registry of Toxic Effects of Chemical Substances)

Dermal Exposure Route

No data available

Inhalation (Dust/Mist) Exposure Route

No data available

Inhalation (Vapor) Exposure Route

No data available

Inhalation (Gas) Exposure Route

No data available

Oral Exposure Route

No data available

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Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route No data available

Inhalation (Gas) Exposure Route No data available

Ingredient Reproductive Toxicity Data

Oral Exposure Route No data available

Dermal Exposure Route No data available

Inhalation (Dust/Mist) Exposure Route No data available

Inhalation (Vapor) Exposure Route If available, see data below

Chemical Name	Endpoint type	Reported dose	Exposure time	Toxicological effects	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Rabbit TC _{Lo}	.02 mg/L	7 hours	Specific Developmental Abnormalities Musculoskeletal system	OECD (Organization for Economic Co-operation and Development)

Inhalation (Gas) Exposure Route No data available

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

Very toxic to aquatic life with long lasting effects

Unknown Aquatic Toxicity 0% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Product Ecological Data

Aquatic toxicity

Fish No data available

Crustacea No data available

Algae No data available

Other Aquatic Species No data available

Terrestrial toxicity

Soil No data available

Vertebrates No data available

Invertebrates No data available

Ingredient Ecological Data

Aquatic toxicity

Fish If available, see ingredient data below

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	96 hours	<i>Pimephales promelas</i>	LC ₅₀	0.0012 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Chromium trioxide (<0.1%) CAS#: 1333-82-0	96 hours	<i>Tilapia mossambica</i>	LC ₅₀	21.05 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	96 hours	<i>Lepomis macrochirus</i>	LC ₅₀	> 16 mg/L	IUCLID (The International Uniform Chemical Information Database)
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	7 days	<i>Oncorhynchus gorbuscha</i>	LC ₅₀	0.14 mg/L	EPA (United States Environmental Protection Agency)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	217 days	<i>Salmo trutta</i>	EC ₁₀	0.00019 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)

Crustacea

If available, see ingredient data below

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	48 Hours	<i>Daphnia magna</i>	LC ₅₀	0.00022 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Chromium trioxide (<0.1%) CAS#: 1333-82-0	48 Hours	<i>Daphnia magna</i>	EC ₅₀	0.162 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)
Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	48 hours	<i>Crangon crangon</i>	EC ₅₀	> 70 mg/L	IUCLID (The International Uniform Chemical Information Database)
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	48 hours	<i>Ceriodaphnia dubia</i>	EC ₅₀	0.0045 mg/L	GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)

Algae

If available, see ingredient data below

Chemical Name	Exposure time	Species	Endpoint type	Reported dose	Key literature references and sources for data
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	14 days	<i>Pseudokirchnerella subcapitata</i>	EC ₅₀	0.033 mg/L	EPA (United States Environmental Protection Agency)

Other Aquatic Species

No data available

Terrestrial toxicity

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Soil No data available
Vertebrates No data available
Invertebrates No data available

Other Information

Persistence and degradability

None known.

Product Biodegradability Data

If available, see ingredient data below.

Ingredient Biodegradability Data

Test data reported below

Chemical Name	Test method	Biodegradation	Exposure time	Results
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	Inorganic Salt	None reported	None reported	Not readily biodegradable
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	Inorganic Salt	None reported	None reported	Not readily biodegradable

Bioaccumulation

If available, see ingredient data below.

Product Bioaccumulation Data

If available, see ingredient data below.

Ingredient Bioaccumulation Data

No data available

Chemical Name	Test method	Exposure time	Species	Bioconcentration factor (BCF)	Results
Mercuric sulfate (0.1 - 1%) CAS#: 7783-35-9	None reported	None reported	None reported	BCF > 1000	Has the potential to bioaccumulate
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	None reported	8 days	<i>Oncorhynchus mykiss</i>	BCF = 2.5	Does not have the potential to bioaccumulate

Additional information

Product Information

Partition Coefficient (n-octanol/water)

Not applicable

Ingredient Information

Chemical Name	Partition Coefficient	Method

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	(n-octanol/water)	
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	log K _{ow} > 6.18	Estimation through KOWWIN v1.68 part of the Estimation Programs Interface (EPI) Suite™

Mobility

Mobility in soil: High mobility. If available, see ingredient data below.

Product Information

Soil Organic Carbon-Water Partition Coefficient Not applicable

Ingredient Information

Chemical Name	Soil Organic Carbon-Water Partition Coefficient	Method
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	log K _{oc} > 4.83	No information available

Additional information

Water solubility

Product Information

Water solubility classification	Water solubility	Water Solubility Temperature
Soluble	> 1000 mg/L	25 °C / 77 °F

Ingredient Information

Chemical Name	Water solubility classification	Water solubility	Water solubility temperature °C	Water solubility temperature °F
Sulfuric acid (80 - 90%) CAS#: 7664-93-9	Soluble	> 1000 mg/L	25 °C	77 °F
Sulfuric acid, disilver(1+) salt (0.1 - 1%) CAS#: 10294-26-5	Soluble	8000 mg/L	20 °C	68 °F

Other adverse effects

Contains a substance with an endocrine-disrupting potential.

Section 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products

Disposal should be in accordance with applicable regional, national, and local laws and regulations
 Dispose of in accordance with federal, state and local regulations

Contaminated packaging

Do not reuse container

Section 14: TRANSPORT INFORMATION

IMDG

14.1 UN/ID no	UN1830
14.2 Proper shipping name	Sulphuric Acid
14.3 Hazard Class	8
14.4 Packing Group	II
14.5 Marine pollutant	This material meets the definition of a marine pollutant
14.6 Special precautions for user	Not applicable

ADR

14.1 UN/ID no	UN1830
14.2 Proper shipping name	Sulphuric Acid
14.3 Hazard Class	8
14.4 Packing Group	II
14.5 Environmental hazard	Not applicable
14.6 Special Provisions	None

IATA

14.1 UN/ID no	UN1830
14.2 Proper shipping name	Sulphuric Acid
14.3 Hazard Class	8
14.4 Packing Group	II
14.5 Environmental hazard	Not applicable
14.6 Special Provisions	None
ERG Code	137

Additional information

There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.

If the item is part of a reagent set or kit the classification would change to the following:

UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.

If the item is not regulated, the Chemical Kit classification does not apply.

Section 15: REGULATORY INFORMATION

Regulatory information

Singapore

Environmental Protection and Management (Hazardous Substances) Regulations

Verify that license requirements are met.

Chemical Name	Hazardous Substances	transport
Sulfuric acid	X	-
Mercuric sulfate	X	-

Environmental Public Health Act

Dispose of waste product or used containers according to local regulations.

Hazardous Waste (Control of Export, Import and Transit) Act

It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Take note that wastes may be subject to export, import, or transit controls pursuant to the Basel convention and/or local regulations implementing the Basel convention.

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Maritime and Port Authority of Singapore (Dangerous Goods, Petroleum and Explosives) Regulations

Regulated. See section 14 for more information.

Misuse of Drugs Act

Verify that requirements related to using, handling, and storing substances subject to prohibition, authorization or restriction are met.

Chemical Name	Misuse of Drugs Act
Sulfuric acid	Third schedule - Part II

Strategic Goods (Control) Act

Verify that requirements related to using, handling, and storing substances subject to prohibition, authorization or restriction are met.

Chemical Name	Strategic Goods (Control) Act
Chromium trioxide	ML8. composited with powdered metal or other high energy fuel components

Workplace Safety and Health Act

See section 8 for national exposure control parameters. Comply with the health and safety at work laws.

Pre-employment screening and appropriate health surveillance

Chemical Name	Pre-employment screening and appropriate health surveillance
Mercuric sulfate - 7783-35-9	X

International Regulations

Ozone-depleting substances (ODS) Not applicable

Persistent Organic Pollutants Not applicable

Export Notification requirements

Chemical Name	Export Notification requirements
Mercuric sulfate - 7783-35-9	Rotterdam

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
TCSI	Complies
AICS	Complies
NZIoC	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substances Inventory

AICS - Australian Inventory of Chemical Substances

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NZIoC - New Zealand Inventory of Chemicals

Section 16: OTHER INFORMATION

Classification Guidance Used

Product is a mixture classified and labelled according to EC1272/2008.

Key or legend to abbreviations and acronyms used in the safety data sheet

SVHC: Substances of Very High Concern for Authorization:

<i>NIOSH IDLH</i>	<i>Immediately Dangerous to Life or Health</i>
ACGIH	ACGIH (American Conference of Governmental Industrial Hygienists)
NDF	<i>no data</i>

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Ceiling Limit Value	MAC	Maximum Allowable Concentration
X	Listed	Vacated	These values have no official status. The only binding levels of contaminants are those listed in the final OSHA PEL. These lists are for reference purposes only. Please note that some reference state regulations of these "liberated" exposure limits in their state regulations.
SKN*	Skin designation	SKN+	Skin sensitization
RSP+	Respiratory sensitization	**	Hazard Designation
C	Carcinogen	R	Reproductive toxicant
M	mutagen		

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Revision Note None

Restrictions on use None

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

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End of Safety Data Sheet