

1. IDENTIFICATION

Product identifier

Product Name Digestion Solution for COD 20-1500 mg/l Range

Other means of identification

Product Code(s) CABDH0401-150

Safety data sheet number M00485

UN/ID no UN1830

Recommended use of the chemical and restrictions on use

Recommended Use Laboratory Use Determination of Chemical Oxygen Demand

Uses advised against Consumer use

Details of the supplier of the safety data sheet

Initial Supplier Identifier

VWR International
2360 Argentia Road Mississauga, Ontario Canada, L5N 5Z7
Tel: 1-800-932-5000

Manufacturer Address

VWR International LLC
100 Matsonford Rd, Building One, Suite 200
Radnor, PA 19087 USA
Tel: +1 610-386-1700

Emergency telephone number

Emergency Telephone CANUTEC 613-992-4624
Chemtrec 1-800-424-9300

2. HAZARD IDENTIFICATION

Classification

| | |
|---|-------------|
| Corrosive to metals | Category 1 |
| Acute toxicity - Oral | Category 4 |
| Acute toxicity - Dermal | Category 3 |
| Acute toxicity - Inhalation (Dusts/Mists) | Category 4 |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/eye irritation | Category 1 |
| Skin sensitization | Category 1 |
| Germ cell mutagenicity | Category 1B |
| Carcinogenicity | Category 1A |
| Reproductive toxicity | Category 2 |
| Acute aquatic toxicity | Category 1 |

Chronic aquatic toxicity

Category 1

Label elements

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
H317 - May cause an allergic skin reaction
H332 - Harmful if inhaled
H340 - May cause genetic defects
H350 - May cause cancer
H361 - Suspected of damaging fertility or the unborn child
H410 - Very toxic to aquatic life with long lasting effects



Precautionary Statements

P271 - Use only outdoors or in a well-ventilated area
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]
P363 - Wash contaminated clothing before reuse
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
P310 - Immediately call a POISON CENTER or doctor
P272 - Contaminated work clothing should not be allowed out of the workplace
P302 + P352 - IF ON SKIN: Wash with plenty of water and soap
P362 + P364 - Take off contaminated clothing and wash it before reuse
P201 - Obtain special instructions before use
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P405 - Store locked up
P273 - Avoid release to the environment
P391 - Collect spillage
P234 - Keep only in original packaging

P390 - Absorb spillage to prevent material damage
P270 - Do not eat, drink or smoke when using this product
P501 - Dispose of contents/ container to an approved waste disposal plant

Unknown Acute Toxicity

0 % of the mixture consists of ingredient(s) of unknown toxicity.
0 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)
0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)

Other Hazards Known

Not applicable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Not applicable

Mixture

Chemical Family

Mixture.

Chemical nature

Aqueous solution of inorganic acids and salts.

| Chemical name | Synonyms | CAS No. | Percent Range | Units | HMIRA # |
|---|---|------------|---------------|-------|---------|
| Sulfuric acid | Oil of vitriol | 7664-93-9 | 80 - 90% | g | - |
| Sulfuric acid, mercury(2+) salt (1:1) | Mercuric Sulfate Mercury(II) Sulfate | 7783-35-9 | <1% | g | - |
| Sulfuric acid, disilver(1+) salt | Silver Sulfate | 10294-26-5 | <1% | g | - |
| Chromic acid (H ₂ CrO ₄) | No information available | 7738-94-5 | <1% | g | - |

4. FIRST AID MEASURES

Description of first aid measures

General advice

Show this safety data sheet to the doctor in attendance. IF exposed or concerned: Get medical advice/attention.

Inhalation

Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. 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. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur.

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Keep eye wide open while rinsing. Do not rub affected area. Get immediate medical advice/attention.

Skin contact

Get immediate medical advice/attention. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. May cause an allergic skin reaction.

Ingestion

Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get immediate medical advice/attention.

Self-protection of the first aider

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. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Avoid breathing vapors or mists. Use personal protective equipment as required. See section 8 for more information.

Most important symptoms and effects, both acute and delayed

Symptoms Burning sensation. Itching. Rashes. Hives. Coughing and/ or wheezing. Difficulty in breathing.

Indication of any immediate medical attention and special treatment needed

Note to physicians Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. May cause sensitization in susceptible persons. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable 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.

Specific hazards arising from the chemical The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. Product is or contains a sensitizer. May cause sensitization by skin contact.

Hazardous combustion products This material will not burn.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

WHMIS Notice Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Personal precautions Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Attention! Corrosive material. Keep people away from and upwind of spill/leak. Avoid breathing vapors or mists.

Other Information Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not allow to enter into soil/subsoil. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Take off contaminated clothing and wash before reuse. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Remove contaminated clothing and shoes. Avoid breathing vapors or mists.

Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Store locked up. Keep out of the reach of children. Store away from other materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits

| Chemical name | Alberta OEL | British Columbia OEL | Manitoba OEL | New Brunswick OEL | New Foundland & Labrador OEL |
|--|---|---|--------------------------------------|---|--------------------------------------|
| Sulfuric acid 80 - 90% | TWA: 1 mg/m ³ STEL: 3 mg/m ³ | TWA: 0.2 mg/m ³ | TWA: 0.2 mg/m ³ | TWA: 1 mg/m ³ STEL: 3 mg/m ³ | TWA: 0.2 mg/m ³ |
| Sulfuric acid, mercury(2+) salt (1:1) <1% | TWA: 0.025 mg/m ³ SKN* | TWA: 0.025 mg/m ³ SKN* R | TWA: 0.025 mg/m ³ SKN* | TWA: 0.025 mg/m ³ SKN* | TWA: 0.025 mg/m ³ SKN* |
| Sulfuric acid, disilver(1+) salt <1% | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³ | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ |
| Chromic acid (H ₂ CrO ₄) <1% | TWA: 0.05 mg/m ³ TWA: 0.5 mg/m ³ | NDF | NDF | TWA: 0.05 mg/m ³ | NDF |

| Chemical name | Northwest Territories OEL | Nova Scotia OEL | Nunavut OEL | Ontario TWA | Prince Edward Island OEL |
|--|---|--------------------------------------|---|--------------------------------------|------------------------------|
| Sulfuric acid 80 - 90% | TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³ | TWA: 0.2 mg/m ³ | TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³ | TWA: 0.2 mg/m ³ | TWA: 0.2 mg/m ³ |
| Sulfuric acid, mercury(2+) salt (1:1) <1% | TWA: 0.025 mg/m ³ STEL: 0.075 mg/m ³ SKN* | TWA: 0.025 mg/m ³ SKN* | TWA: 0.025 mg/m ³ STEL: 0.075 mg/m ³ SKN* | TWA: 0.025 mg/m ³ SKN* | TWA: 0.025 mg/m ³ |
| Sulfuric acid, disilver(1+) salt <1% | TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³ | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³ | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ |

| Chemical name | Quebec OEL | Saskatchewan OEL | Yukon OEL |
|--|---|---|---|
| Sulfuric acid 80 - 90% | TWA: 1 mg/m ³ STEL: 3 mg/m ³ | TWA: 0.2 mg/m ³ STEL: 0.6 mg/m ³ | STEL: 1 mg/m ³ TWA: 1 mg/m ³ |
| Sulfuric acid, mercury(2+) salt (1:1) <1% | TWA: 0.025 mg/m ³ SKN* | TWA: 0.025 mg/m ³ STEL: 0.075 mg/m ³ SKN* | NDF |
| Sulfuric acid, disilver(1+) salt <1% | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ STEL: 0.03 mg/m ³ | STEL: 0.03 mg/m ³ TWA: 0.01 mg/m ³ |

| | | | |
|--|-----|--|---|
| Chromic acid (H ₂ CrO ₄) <1% | NDF | TWA: 0.05 mg/m ³ TWA: 0.5 mg/m ³ STEL: 0.15 mg/m ³ STEL: 1.5 mg/m ³ | STEL: 0.1 mg/m ³ TWA: 0.1 mg/m ³ |
|--|-----|--|---|

| Chemical name | ACGIH TLV | OSHA PEL | NIOSH IDLH |
|--|------------------------------------|--|--|
| Sulfuric acid 80 - 90% | TWA: 0.2 mg/m ³ | TWA: 1 mg/m ³ (vacated) TWA: 1 mg/m ³ | IDLH: 15 mg/m ³ TWA: 1 mg/m ³ |
| Sulfuric acid, mercury(2+) salt (1:1) <1% | TWA: 0.025 mg/m ³ S* | (vacated) Ceiling: 0.1 mg/m ³ | 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 <1% | TWA: 0.01 mg/m ³ | TWA: 0.01 mg/m ³ (vacated) TWA: 0.01 mg/m ³ | IDLH: 10 mg/m ³ Ag TWA: 0.01 mg/m ³ Ag |
| Chromic acid (H ₂ CrO ₄) <1% | NDF | TWA: 5 µg/m ³ (vacated) Ceiling: 0.1 mg/m ³ Ceiling: 0.1 mg/m ³ | TWA: 0.0002 mg/m ³ Cr |

Legend

See section 16 for terms and abbreviations

Appropriate engineering controls

Engineering Controls

Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Respiratory protection

No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Hand Protection

Wear suitable gloves. Impervious gloves.

Eye/face protection

Face protection shield.

Skin and body protection

Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene Considerations

Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and immediately after handling the product. Contaminated work clothing should not be allowed out of the workplace.

Environmental exposure controls

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

Thermal hazards

None under normal processing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state

Liquid

Appearance

Turbid solution

Color

light orange

Odor

Odorless

Odor threshold

Not applicable

Property

Values

Remarks • Method

Molecular weight

Not applicable

| | | |
|---|--|---|
| pH | < 0.5 | |
| Melting point/freezing point | ~ 0 °C / 32 °F | Estimation based on theoretical calculation |
| Boiling point / boiling range | ~ 100 °C / 212 °F | Estimation based on theoretical calculation |
| Evaporation rate | 1.04 (water = 1) | Estimation based on theoretical calculation |
| Vapor pressure | 0.975 mm Hg / 0.13 kPa at 145.8 °C / 294.44 °F | |
| Vapor density (air = 1) | 0.62 (air = 1) | |
| Specific gravity (water = 1 / air = 1) | 1.776 | |
| Partition Coefficient (n-octanol/water) | No data available | |
| Soil Organic Carbon-Water Partition Coefficient | No data available | |
| Autoignition temperature | No data available | |
| Decomposition temperature | No data available | |
| Dynamic viscosity | No data available | |
| Kinematic viscosity | No data available | |

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 |

Other Information

Metal Corrosivity

Classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate

> 6.25 mm/yr / > 0.25 in/yr

Aluminum Corrosion Rate

> 6.25 mm/yr / > 0.25 in/yr

Volatile Organic Compounds (VOC) Content

| Chemical name | CAS No. | Volatile organic compounds (VOC) content | CAA (Clean Air Act) |
|---|----------------|---|----------------------------|
| Sulfuric acid | 7664-93-9 | No data available | - |
| Sulfuric acid, mercury(2+) salt (1:1) | 7783-35-9 | Not applicable | - |
| Sulfuric acid, disilver(1+) salt | 10294-26-5 | No data available | - |
| Chromic acid (H ₂ CrO ₄) | 7738-94-5 | No data available | - |

Explosive properties

| | |
|-----------------------------------|--------------------------|
| Upper explosion limit | No data available |
| Lower explosion limit | No data available |
| Flammable properties | |
| Flash point | No data available |
| Flammability Limit in Air | |
| Upper flammability limit: | No data available |
| Lower flammability limit: | No data available |
| Oxidizing properties | No data available. |
| Bulk density | Not applicable |
| Particle Size | No information available |
| Particle Size Distribution | No information available |

10. STABILITY AND REACTIVITY

Reactivity

Not applicable.

Chemical stability

Stability Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact None

Sensitivity to Static Discharge None.

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Exposure to air or moisture over prolonged periods. Excessive heat.

Incompatible materials

Incompatible materials Oxidizing agent. Acids. Bases.

Hazardous Decomposition Products

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

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Product Information

Inhalation

Corrosive by inhalation. Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. Harmful by inhalation.

Eye contact

Causes burns. Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

| | |
|--|--|
| Skin contact | May cause irritation. May cause sensitization by skin contact. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Toxic in contact with skin. |
| Ingestion | Causes burns. Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways. |
| Aggravated Medical Conditions | Eye disorders. Skin disorders. Respiratory disorders. Preexisting eye disorders. Kidney disorders. Nasal Septum. Teeth. |
| 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. |
| Sulfuric acid, mercury(2+) salt (1:1) (<1%) CAS#: 7783-35-9 | Central nervous system is the most sensitive target for mercury exposure. |
| Chromic acid (H ₂ CrO ₄) (<1%) CAS#: 7738-94-5 | Chromium is human carcinogen mostly by inhalation exposure. |

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms Redness. Burning. May cause blindness. Coughing and/ or wheezing. Itching. Rashes. Hives.

Product Acute Toxicity Data

Test data reported below

Oral Exposure Route

| Endpoint type | Reported dose | Key literature references and sources for data |
|-------------------------|---------------|--|
| Rat LD ₅₀ | 360 mg/kg | Outside testing |

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.

0 % of the mixture consists of ingredient(s) of unknown acute dermal toxicity

0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (dust/mist)

0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (vapor)

0 % of the mixture consists of ingredient(s) of unknown acute inhalation toxicity (gas)

Acute Toxicity Estimations (ATE)

The following values are calculated based on chapter 3.1 of the GHS document

| | |
|-------------------------------|--------------------------|
| ATEmix (oral) | No information available |
| ATEmix (dermal) | 583.00 mg/kg |
| ATEmix (inhalation-dust/mist) | 4.18 mg/L |
| ATEmix (inhalation-vapor) | No information available |
| ATEmix (inhalation-gas) | No information available |

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 (<1%) CAS#: 10294-26-5 | Rat LD ₅₀ | > 5000 mg/kg | None reported | None reported | Vendor SDS |
| Chromic acid (H ₂ CrO ₄) (<1%) CAS#: 7738-94-5 | Rat LD ₅₀ | 80 mg/kg | None reported | Lungs, Thorax, or Respiration Cyanosis Gastrointestinal Hypermotility Diarrhea Skin and Appendages Other changes | RTECS (Registry of Toxic Effects of Chemical Substances) |
| 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) |
| Sulfuric acid, mercury(2+) salt (1:1) (<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 type | Reported dose | Exposure time | Toxicological effects | Key literature references and sources for data |
|--|----------------------|---------------|---------------|-----------------------|--|
| Sulfuric acid, mercury(2+) salt (1:1) (<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

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 |

Inhalation (Gas) Exposure Route

If available, see data below

Product Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route

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 Specific Target Organ Toxicity Single Exposure Data

Oral Exposure Route

If available, see data below

Dermal Exposure Route

If available, see data below

Inhalation (Dust/Mist) Exposure Route

If available, see data below

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 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

If available, see data below

Aspiration toxicity

If available, see data below

Kinematic viscosity

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) |
| Sulfuric acid, mercury(2+) salt (1:1) (<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 (<1%) CAS#: 10294-26-5 | Standard Draize Test | Rabbit | 500 mg | 4 hours | Not corrosive or irritating to skin | ECHA (The European Chemicals Agency) |

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) |
| Sulfuric acid, mercury(2+) salt (1:1) (<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 (<1%) CAS#: 10294-26-5 | Standard Draize Test | Rabbit | 180 mg | None reported | Corrosive to eyes | ECHA (The European Chemicals Agency) |

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

If available, see data below.

Respiratory Sensitization Exposure Route

If available, see data below.

Chronic Toxicity Information

Product Specific Target Organ Toxicity Repeat Dose 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 Specific Target Organ Toxicity Repeat Exposure Data

Oral Exposure Route

If available, see data below

Dermal Exposure Route

If available, see data below

Inhalation (Dust/Mist) Exposure Route

If available, see data below

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

If available, see data below

Product 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

Ingredient Carcinogenicity Data

| Chemical name | CAS No. | ACGIH | IARC | NTP | OSHA |
|---|------------|-------|---------|-------|------|
| Sulfuric acid | 7664-93-9 | A2 | Group 1 | Known | X |
| Sulfuric acid, mercury(2+) salt (1:1) | 7783-35-9 | - | Group 3 | - | - |
| Sulfuric acid, disilver(1+) salt | 10294-26-5 | - | - | - | - |
| Chronic acid (H ₂ CrO ₄) | 7738-94-5 | - | 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 |
| NTP (National Toxicology Program) | Known - Known Carcinogen |
| OSHA (Occupational Safety and Health Administration of the US Department of Labor) | X - Present |

Oral Exposure Route

If available, see data below

Dermal Exposure Route

If available, see data below

Inhalation (Dust/Mist) Exposure Route

If available, see data below

Inhalation (Vapor) Exposure Route

If available, see data below

Inhalation (Gas) Exposure Route

If available, see data below

Product Germ Cell Mutagenicity *invitro* Data

No data available.

Ingredient Germ Cell Mutagenicity *invitro* 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 | No information available |
|--|-------------------------|---------------|----------|------------------|--|-----------------------------|

Product Germ Cell Mutagenicity *in vivo* 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 Germ Cell Mutagenicity *in vivo* Data

| | |
|---------------------------------------|------------------------------|
| Oral Exposure Route | If available, see data below |
| Dermal Exposure Route | If available, see data below |
| Inhalation (Dust/Mist) Exposure Route | If available, see data below |
| Inhalation (Vapor) Exposure Route | If available, see data below |
| Inhalation (Gas) Exposure Route | If available, see data below |

Product 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 | No data available |
| Inhalation (Gas) Exposure Route | No data available |

Ingredient Reproductive Toxicity Data

| | |
|---------------------------------------|------------------------------|
| Oral Exposure Route | If available, see data below |
| Inhalation (Dust/Mist) Exposure Route | If available, see data below |
| 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 | No information available |

| | |
|---------------------------------|------------------------------|
| Inhalation (Gas) Exposure Route | If available, see data below |
|---------------------------------|------------------------------|

12. ECOLOGICAL INFORMATION

| | |
|--------------------|--|
| Ecotoxicity | Very toxic to aquatic life with long lasting effects |
|--------------------|--|

Product Ecological Data

Aquatic toxicity

| | |
|-----------|-------------------|
| Fish | No data available |
| Crustacea | No data available |
| Algae | 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 (<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) |
| Chromic acid (H ₂ CrO ₄) (<1%) | 96 hours | None reported | LC ₅₀ | 0.0031 mg/L | CEPA (Canadian Environmental Protection Agency) |

| | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|---|
| CAS#: 7738-94-5 | | | | | |
| 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 (<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) |

Algae If available, see ingredient data below

Other Information

| Canadian Environmental Protection Act (CEPA) - Domestic Substances List (DSL): Environmentally Hazardous Substances Categorizations | | | | |
|--|------------|------------|-----------------|---------------------------------------|
| Chemical name | Category | Persistent | Bioaccumulation | Inherently Toxic to Aquatic Organisms |
| Sulfuric acid, disilver(1+) salt (<1%) CAS#: 10294-26-5 | Inorganics | Yes | No | Yes |
| Chromic acid (H ₂ CrO ₄) (<1%) CAS#: 7738-94-5 | Inorganics | Yes | No | Yes |

Persistence and degradability

Product Biodegradability Data

No data available.

Ingredient Biodegradability Data

| Chemical name | Test method | Biodegradation | Exposure time | Results |
|--|----------------|----------------|---------------|---------------------------|
| Sulfuric acid, mercury(2+) salt (1:1) (<1%) CAS#: 7783-35-9 | Inorganic Salt | None reported | None reported | Not readily biodegradable |
| Sulfuric acid, disilver(1+) salt (<1%) CAS#: 10294-26-5 | Inorganic Salt | None reported | None reported | Not readily biodegradable |

Bioaccumulation

Product Bioaccumulation Data

No data available.

Partition Coefficient (n-octanol/water)

No data available

Ingredient Bioaccumulation Data

| Chemical name | Test method | Exposure time | Species | Bioconcentration factor (BCF) | Results |
|--|---------------|---------------|---------------|-------------------------------|------------------------------------|
| Sulfuric acid, mercury(2+) salt (1:1) (<1%) CAS#: 7783-35-9 | None reported | None reported | None reported | BCF > 1000 | Has the potential to bioaccumulate |

| | | | | | |
|--|---------------|--------|----------------------------|-----------|--|
| Sulfuric acid, disilver(1+) salt (<1%) CAS#: 10294-26-5 | None reported | 8 days | <i>Oncorhynchus mykiss</i> | BCF = 2.5 | Does not have the potential to bioaccumulate |
|--|---------------|--------|----------------------------|-----------|--|

Mobility

Soil Organic Carbon-Water Partition Coefficient No data available

Water solubility

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

Other adverse effects

Contains a substance with an endocrine-disrupting potential.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. TRANSPORT INFORMATION

Transport Canada

UN/ID no UN1830
 Proper shipping name Sulfuric acid
 Hazard Class 8
 Packing Group II
 Description UN1830, Sulfuric acid, 8, II
 Emergency Response Guide Number 137

TDG

UN/ID no UN1830
 Proper shipping name Sulfuric acid
 Hazard Class 8
 Packing Group II
 Description UN1830, Sulfuric acid, 8, II

IATA

UN/ID no UN1830
 Proper shipping name Sulphuric acid
 Hazard Class 8
 Packing Group II
 ERG Code 8L
 Description UN1830, Sulphuric acid, 8, II

IMDG

UN/ID no UN1830
 Proper shipping name Sulphuric acid
 Hazard Class 8
 Packing Group II
 EmS-No F-A, S-B

Description UN1830, Sulphuric acid, 8, II

Note: No special precautions necessary.

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.

15. REGULATORY INFORMATION

Regulatory information

National Inventories

DSL/NDSL Complies

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

International Inventories

TSCA 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

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

NZIoC - New Zealand Inventory of Chemicals

Canada - CEPA - Mercury Containing Products

| Chemical name | Canada - CEPA - Mercury Containing Products |
|--|---|
| Sulfuric acid, mercury(2+) salt (1:1) CAS#: 7783-35-9 | Applies |

International Regulations

Ozone-depleting substances (ODS) Not applicable

Persistent Organic Pollutants Not applicable

Export Notification requirements

| Chemical name | Export Notification requirements |
|---|----------------------------------|
| Sulfuric acid, mercury(2+) salt (1:1) - 7783-35-9 | Rotterdam |

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Special Comments

This product contains mercury and may be subject to reporting and recordkeeping requirements

NFPA and HMIS Classifications

| | | | | |
|-------------|---------------------------|-------------------------|-----------------------------|--|
| NFPA | Health hazards - 3 | Flammability - 0 | Instability - 0 | Physical and Chemical Properties SKN* |
| HMIS | Health hazards - 3 | Flammability - 0 | Physical Hazards - 0 | Personal protection - X - See section 8 for more information |

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

| | |
|------------|---|
| NIOSH IDLH | Immediately Dangerous to Life or Health |
| ACGIH | ACGIH (American Conference of Governmental Industrial Hygienists) |
| NDF | no data |

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

| | | | |
|------|---------------------------------|---------|---|
| TWA | TWA (time-weighted average) | STEL | STEL (Short Term Exposure Limit) |
| MAC | Maximum Allowable Concentration | Ceiling | Ceiling Limit Value |
| 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 | | |

Issue Date 28-Jun-2017

Revision Date 05-Apr-2018

Revision Note

SDS sections updated
16

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.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

End of Safety Data Sheet