Dear Customer,

This File Contains Both The ANSI Material Safety Data Sheet and The GHS Safety Data Sheet For The Same Product

Spectrum is currently transitioning all chemical product labeling from the ANSI format to the GHS format (see note below). In order to ensure that you receive complete labeling during the transition, we have included both the ANSI MSDS and the GHS SDS in a single file. The ANSI MSDS is given first, followed by the GHS SDS. Please use whichever matches the container label.

Why It Matters:

The complete precautionary labeling for this chemical consists of BOTH the label on the container AND the matching Material Safety Data Sheet (for ANSI labels) or Safety Data Sheet (for GHS labels). Both elements of the labeling [Label + (M)SDS] are written to be read and understood together, so as to provide complete precautionary information. It is intended for you to read and understood BOTH before handling or using the chemical.

Picking the Right One: 2 Easy Ways To Tell Whether Your Container Has an ANSI Label or a GHS Label

1) GHS labels: any pictogram displayed in the upper left-hand corner will be inside a red diamond. ANSI labels: pictograms, if present, will be inside individual black boxes.

2) GHS labels: on the bottom of the right-hand panel of the label, locate the Lot Number. Directly to the left will be a string of control characters, followed by a single letter. For GHS labels, the string of characters will end in "GHS:"

---

**Label in ANSI Format**

---

**Label in GHS Format**

---

CORPORATE OFFICES
14422 South San Pedro Street
Gardena, California 90248
PHONE 310.516.8000
FAX 310.516.9843

AN ISO 9001:2008 REGISTERED COMPANY

www.spectrumchemical.com
Sincerely,

Regulatory Affairs

1 American National Standards Institute
2 Globally Harmonized System for Hazard Communication
# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product code:</th>
<th>C-223</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name:</td>
<td>CHROMACLEAN(R)</td>
</tr>
<tr>
<td>Chemical Name:</td>
<td>No information available</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>No information available</td>
</tr>
<tr>
<td>Recommended use:</td>
<td>No information available</td>
</tr>
<tr>
<td>CAS #:</td>
<td>Mixture</td>
</tr>
<tr>
<td>RTECS #:</td>
<td>Not available</td>
</tr>
<tr>
<td>Formula:</td>
<td>No information available</td>
</tr>
<tr>
<td>CI#:</td>
<td>Not available</td>
</tr>
</tbody>
</table>
| Supplier:      | Spectrum Chemicals and Laboratory Products, Inc.  
|                | 14422 South San Pedro St.  
|                | Gardena, CA 90248       |
|                | (310) 516-8000         |
| Order Online At: | [https://www.spectrumchemical.com](https://www.spectrumchemical.com) |
| Emergency Telephone Number: | CHEMTREC: 1-800-424-9300 |
| Contact Person: | Regina Wachenheim (East Coast) |
| Contact Person: | Martin LaBenz (West Coast) |

## 2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
<th>Personal Protective Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Hazard</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

See Section 8.
2. HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Carcinogen Status:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>A2 - Suspected Human Carcinogen by ACGIH (contained in strong inorganic acid mists</td>
</tr>
<tr>
<td></td>
<td>Group 1- Carcinogenic to humans by IARC (Strong-organic-acid mists containing sulfuric</td>
</tr>
<tr>
<td></td>
<td>acid)</td>
</tr>
<tr>
<td>Water</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Group 1- Carcinogenic to humans by IARC</td>
</tr>
<tr>
<td></td>
<td>Known Human Carcinogen by NTP</td>
</tr>
<tr>
<td></td>
<td>OSHA HCS - Carcinogens: Present</td>
</tr>
</tbody>
</table>

**Principal Routes of Exposure:**
Skin. Inhalation. Ingestion.

**Acute Potential Health Effects:**

**Skin Contact:**
Severe skin irritation. Causes skin burns. May cause sensitization by skin contact. May cause allergic skin reaction.

**Eye Contact:**
Severe eye irritation. Causes eye burns.

**Inhalation:**
Harmful by inhalation. May cause chemical burns to the respiratory tract. May cause sensitization by inhalation. May cause allergic respiratory reaction.

**Ingestion:**
Causes burns. Can burn mouth, throat, and stomach. May cause metabolic acidosis.

**Chronic Potential Health Effects:**

**Target Organs:**

**Mutagenic Effects:**
For Chromium Trioxide
May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells
Mutagenic effects on mammalian germ cells
Teratogenic Effects: For Sulfuric Acid:

Developmental effects and Teratogenicity: According to the Registry of Toxic Effects of Chemical Substances (RTECS reference - Murry et al, "Embryotoxicity of Inhaled Sulfuric Acid Aerosol in Mice and Rabbits", Journal of Environmental Science and Health, Part C, Vol. 13, pages 251-266, 1979), musculoskeletal developmental abnormalities were found in rabbits at a dose of 20 mg/m³ for 7 hrs. However, REPROTOX and Shepard’s Catalog of Teratogenic Agents, citing this same study, stated that inhalation of sulfuric acid fumes did not increase congenital anomalies in the offspring of treated pregnant mice or rabbits. Furthermore, the Hazard Substance Data Bank (HSDB) also stated that in a developmental toxicity study conducted under a method similar to OECD test Guideline 414 that no significant effects on mean numbers of implants/dam, live fetuses/liter or resorptions/litter were observed in mice and rabbits exposed by inhalation to sulfuric acid aerosol at 5 and 20 mg/m³ during gestation and therefore could not be considered embryotoxic, or fetotoxic.

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-9</td>
<td>84-85</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>15-16</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>1333-82-0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact: Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician immediately.

Eye Contact: Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or 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. Immediate medical attention is required. Call a physician immediately.
Ingestion:
Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is conscious, give water or milk. Follow with Milk of Magnesia or egg whites beaten with water. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Notes to Physician:
Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

Flashpoint (°C/°F): No information available.

Flash Point Tested according to:
Not available

Lower Explosion Limit (%): No information available
Upper Explosion Limit (%): No information available

Autoignition Temperature (°C/°F): No information available

Suitable Extinguishing Media:
The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media:
No information available.

Hazardous Combustion Products:
No information available.

Specific hazards:
For Sulfuric Acid:. Contact with metals may evolve flammable hydrogen gas. Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid.
White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact.
May ignite other combustible materials.
May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.. Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxycromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picrates, fulminates, dienes, alcohols (when heated) Nitramide decomposes explosively on contact with concentrated sulfuric acid.
1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decomposition. Containers may explode when heated or if contaminated with water. Reaction with water may generate much heat which will increase the concentration of fumes in the air.

Special Protective Equipment for Firefighters:
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
Specific Methods: Water mist may be used to cool closed containers. Do not use water on material itself. Do not get water inside containers. When material is not involved in a fire, do not use water on material itself. DO NOT use combustible materials such as sawdust.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not let product enter drains. Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas.

Methods for Cleaning Up: Neutralize with Sodium carbonate or Sodium bicarbonate. Dilute with water. Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions: Use only in area provided with appropriate exhaust ventilation. Do not allow contact with water. Keep away from incompatible materials.

Safe Handling Advice: Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions: Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. May corrode metallic surfaces. Do not store in uncoated metallic containers. Store in a segregated and approved area. Do not store near combustible materials. Store away from incompatible materials.


8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Personal Protective Equipment

Eye protection: Face-shield.
Skin and body protection: Chemical resistant protective suit. Gloves. boots.

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

National occupational exposure limits

<table>
<thead>
<tr>
<th>United States</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid - 7664-93-9</td>
<td>1 mg/m³ TWA</td>
<td>1 mg/m³ TWA</td>
<td>0.2 mg/m³ TWA thoracic fraction</td>
<td>None</td>
</tr>
<tr>
<td>Water - 7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide - 1333-82-0</td>
<td>None</td>
<td>0.0002 mg/m³ TWA Cr</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Canada</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid 7664-93-9</td>
<td>1 mg/m³ TWA</td>
<td>0.2 mg/m³ TWA thoracic</td>
<td>1 mg/m³ TWAEV</td>
<td>3 mg/m³ STEV</td>
</tr>
<tr>
<td>Water 7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide 1333-82-0</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Australia and Mexico</th>
<th>Australia</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid 7664-93-9</td>
<td>3 mg/m³ STEL</td>
<td>1 mg/m³ TWA</td>
</tr>
<tr>
<td>Water 7732-18-5</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide 1333-82-0</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES
### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>No information available</td>
</tr>
<tr>
<td>Color</td>
<td>Red brown</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless, but has a choking odor when hot.</td>
</tr>
<tr>
<td>Taste</td>
<td>No information available</td>
</tr>
<tr>
<td>Molecular/Formula weight</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash point (°C):</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower Explosion Limit (%):</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper Explosion Limit (%):</td>
<td>No information available</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/range(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Boiling point/range(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.5-1.6 (calculated)</td>
</tr>
<tr>
<td>Density (g/cm³):</td>
<td>No information available</td>
</tr>
<tr>
<td>Decomposition temperature(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Bulk density</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure @ 20°C (kPa):</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>3.37</td>
</tr>
<tr>
<td>VOC content (g/L):</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor threshold (ppm):</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>No information available</td>
</tr>
<tr>
<td>Miscibility</td>
<td>No information available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in Water</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>No information available</td>
</tr>
<tr>
<td>Color</td>
<td>Red brown</td>
</tr>
<tr>
<td>Flash point (°C):</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower Explosion Limit (%):</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper Explosion Limit (%):</td>
<td>No information available</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/range(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Boiling point/range(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.5-1.6 (calculated)</td>
</tr>
<tr>
<td>Density (g/cm³):</td>
<td>No information available</td>
</tr>
<tr>
<td>Decomposition temperature(°C/°F):</td>
<td>No information available</td>
</tr>
<tr>
<td>Bulk density</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure @ 20°C (kPa):</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>3.37</td>
</tr>
<tr>
<td>VOC content (g/L):</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor threshold (ppm):</td>
<td>No information available</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>No information available</td>
</tr>
<tr>
<td>Miscibility</td>
<td>No information available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in Water</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability:</td>
<td>Stable at normal conditions</td>
</tr>
<tr>
<td>Conditions to avoid:</td>
<td>Incompatible materials. Exposure to water.</td>
</tr>
<tr>
<td>Hazardous decomposition products:</td>
<td>Sulphur oxides.</td>
</tr>
</tbody>
</table>

Product code: C-223  
Product name: CHROMACLEAN(R)
Possibility of Hazardous Reactions:
Reacts violently with water
It reacts with alcohols and amines
Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPRANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GYROXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile+water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium trimerchomate, Aniline, Bromate + metals, Bromine pentafluoride, n-Butylraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxide, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthlene + sulfur, Diisobutylene, p-dimethylaminobenzaldehyde, 1,3-Diazobenzen, Dimethylbenzylcarbinol + hydrogen peroxide, Epichlorohydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, Ethylenimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mercuric oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycerides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphane, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Potassium Permanganate + water, Propiolactone (beta)-, Pyridine, Rubidium acetylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chloride, Zinc Iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyanohalogenides, metal acetylides,

Evolves flammable hydrogen gas on contact with metals
Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds

Polymerization:
Hazardous polymerisation does not occur

Corrosivity:

Special Remarks on Corrosivity:
No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Sulfuric Acid - 7664-93-9
LD50/oral/rat = 2140 mg/kg Oral LD50 Rat
Local Effects

Skin irritation: Corrosive. Severe skin irritation. Causes burns.

Eye irritation: Corrosive. Severe eye irritation. Causes burns. May cause irreversible eye damage.

Inhalation: Harmful by inhalation. Causes severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, sneezing, shortness of breath, and delayed lung edema. Can cause chemical burns (corrosive action) to the respiratory tract and mucous membranes. Inhalation may be fatal as a result of bronchospasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory shock/collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Ischemic liver and heart lesions, kidney failure may occur several hours after unchecked circulatory collapse. Circulatory shock is often the immediate cause of death. May also affect teeth (changes in teeth and supporting structures - erosion, discoloration).

Ingestion: May be harmful if swallowed. Causes digestive or gastrointestinal tract burns. Corrosive to the mouth, throat, and stomach. May cause permanent damage to the digestive tract. May cause perforation of the digestive tract. May cause gastritis. May cause abdominal pain. Ingestion may cause nausea, vomiting. Vomit may resemble "coffee grounds". May cause metabolic acidosis.
Sensitization: May cause sensitization by inhalation and skin contact

Chronic Toxicity

For Sulfuric Acid: Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and respiratory system/lungs (pulmonary edema, lung damage/changes in lung function with chronic bronchitis and emphysema), teeth (dental discoloration, erosion).

Skin: Prolonged or repeated skin contact may cause dermatitis.

Eyes: Conjunctivitis is also a common finding with chronic exposure. For Chromium trioxide: Skin: Repeated or prolonged skin contact may cause allergic contact dermatitis (allergic skin reaction). May also cause slow-healing skin ulcers ("chrome sores"), particularly if skin is broken.

Eyes: Repeated or prolonged eye contact may cause conjunctivitis.

Inhalation: Repeated or prolonged inhalation may cause allergic respiratory reaction. It may cause chronic respiratory tract irritation with chronic rhinitis, hyperemia, chronic catarrh, congestion of the larynx, inflammation of the larynx, polyps of the upper respiratory tract, chronic inflammation of the lungs, emphysema, tracheitis, chronic bronchitis, bronchospasm (asthma), chronic pharyngitis, bronchopneumonia, ulceration and perforation of the nasal septum.

Ingestion: Repeated or prolonged ingestion may cause nausea, vomiting, loss of appetite, kidney damage, inflammation of the liver or even hepatitis with jaundice, leukocytosis, leukopenia, monocytes, and eosinophilia.

Carcinogenic effects:

For Sulfuric Acid: May cause cancer. However, evidence is inconclusive. Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC Group 1). However, this classification applies only to mists containing sulfuric acid generated during an industrial process and not to (almost) pure sulfuric acid or sulfuric acid solutions.

The ACGIH has classified "strong inorganic acid mists containing sulfuric acid" as a suspected human carcinogen (ACGIH Group A2). However, this classification applies only to mists containing sulfuric acid generated during an industrial process and not to (almost) pure sulfuric acid or sulfuric acid solutions.

For Chromium Trioxide: Carcinogenic

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA HCS - Carcinogens</th>
<th>ACGIH - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Not listed</td>
<td>Group 1 - Monograph 54 [1992] Occupational exposure to mists and vapours from sulfuric acid and other strong inorganic acids</td>
<td>Present</td>
<td>A2 Suspected Human Carcinogen (contained in strong inorganic acid mists)</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Water</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Product code: C-223 Product name: CHROMACLEAN(R)
Chromium Trioxide Known Human Carcinogen Chromium hexavalent compounds


Present Not listed Not listed Not listed

Mutagenic Effects: For Chromium Trioxide
May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells
Mutagenic effects on mammalian germ cells

Reproductive Effects: May cause adverse reproductive effects based on animal data. Possible risk of impaired fertility.

Teratogenic Effects: For Sulfuric Acid: Developmental effects and Teratogenicity: According the the Registry of Toxic Effects of Chemical Substances (RTECS reference - Murry et al, "Embryotoxicity of Inhaled Sulfuric Acid Aerosol in Mice and Rabbits", Journal of Environmental Science and Health, Part C, Vol. 13, pages 251-266, 1979), musculoskeletal developmental abnormalities were found in rabbits at a dose of 20 mg/m³ for 7 hrs. However, REPROTOX and Shepard's Catalog of Teratogenic Agents, citing this same study, stated that inhalation of sulfuric acid fumes did not increase congenital anomalies in the offspring of treated pregnant mice or rabbits. Furthermore, the Hazard Substance Data Bank (HSDB) also stated that in a developmental toxicity study conducted under a method similar to OECD test Guideline 414 that no significant effects on mean numbers of implants/dam, live fetuses/liter or resorptions/litter were observed in mice and rabbits exposed by inhalation to sulfuric acid aerosol at 5 and 20 mg/m³ during gestation and therefore could not be considered embryotoxic, or fetotoxic.


12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: Information given is based on data on the components and the ecotoxicology of similar products

Ecotoxicity effects: Aquatic environment.

Aquatic toxicity:

Sulfuric Acid - 7664-93-9
Freshwater Fish Species Data: 500 mg/L LC50 Brachydanio rerio 96 h static 1

Chromium Trioxide - 1333-82-0
Freshwater Fish Species Data: 40 mg/L LC50 Colisa fasciatus 96 h static 1

Mobility: No information available
Persistence and degradability: No information available
Bioaccumulative potential: No information available
13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Water</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT
- UN-No: UN1760
- Proper Shipping Name: Corrosive liquids, n.o.s. (sulfuric acid)
- Hazard Class: 8
- Packing Group: II
- Subsidiary Risk: Not applicable
- Marine Pollutant: No data available
- ERG No: 154
- DOT RQ (lbs): No information available
- Symbol(s): G

TDG (Canada)
- UN-No: UN1760
- Proper Shipping Name: Corrosive liquid, n.o.s.
- Hazard Class: 8
- Packing Group: II
- Subsidiary Risk: No information available
- Description: No information available

ADR
- UN-No: UN1760
- Proper Shipping Name: Corrosive liquid, n.o.s.
- Hazard Class: 8
- Packing Group: II
- Subsidiary Risk: No information available
- Classification Code: No information available
- Description: No information available
- CEFIC Tremcard No: No information available

IMO / IMDG
- UN-No: UN1760
- Proper Shipping Name: Corrosive liquid, n.o.s.
- Hazard Class: 8
- Packing Group: II
- Subsidiary Risk: No information available
- Description: No information available
- IMDG Page: No information available
- Marine Pollutant: No information available
- EMS: F-A
- MFAG: No information available
- Maximum Quantity: No information available

RID

Product code: C-223  Product name: CHROMACLEAN(R)
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: 8
Classification Code: No information available
Description: No information available

ICAO
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
Description: No information available

IATA
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
ERG Code: 8L
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Present</td>
<td>Present</td>
<td>Present KE-32570</td>
<td>Present (1)-724 (1)-430</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-639-5</td>
</tr>
<tr>
<td>Water</td>
<td>Present</td>
<td>Present</td>
<td>Present KE-35400</td>
<td>Not present</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-791-2</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Present R</td>
<td>Present</td>
<td>Present KE-06020</td>
<td>Present (1)-284</td>
<td>Present</td>
<td>Present</td>
<td>Present 215-607-8</td>
</tr>
</tbody>
</table>

U.S. Regulations

Sulfuric Acid

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
1000 lb RQ
100 lb RQ
Louisiana Reportable Quantity List for Pollutants: 1000lbfinal RQ
454kgfinal RQ
California Directors List of Hazardous Substances: Present
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1095

Chromium Trioxide

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
Pennsylvania RTK: Special hazardous substance
Pennsylvania RTK - Special Hazardous Substances: Present


Product code: C-223
Product name: CHROMACLEAN(R)
### Chemicals Known to the State of California to Cause Cancer:
**WARNING:** This product contains a chemical known to the State of California to cause cancer. (See table below)

### Chemicals Known to the State of California to Cause Reproductive Toxicity:
**WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Listed under strong inorganic mists containing sulfuric acid</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Water</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Carcinogen (listed as Chromium (hexavalent compounds))</td>
<td>Developmental toxicity listed as Chromium (hexavalent compounds))</td>
<td>Male Reproductive toxicity listed as Chromium (hexavalent compounds))</td>
<td>Female Reproductive toxicity listed as Chromium (hexavalent compounds))</td>
</tr>
</tbody>
</table>

### CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>1000 lb final RQ 454 kg final RQ</td>
<td>1000 lb TPQ</td>
<td>None</td>
<td>None</td>
<td>1.0 % de minimis concentration</td>
</tr>
<tr>
<td>Water</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Water</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

### Canada

**WHMIS hazard class:**
- E Corrosive material
- D1A Very toxic materials
- D2A Very toxic materials
- D2B Toxic materials

**Sulfuric Acid**
- D1A E including &gt;51%, &lt;=51%

**Water**
- Uncontrolled product according to WHMIS classification criteria

**Chromium Trioxide**
- C D1A D2A D2B E

### Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

<table>
<thead>
<tr>
<th>Components</th>
<th>WHMIS Ingredient Disclosure List -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>1 %</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>0.1 %</td>
</tr>
</tbody>
</table>

### Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
</table>

---

**Product code:** C-223  
**Product name:** CHROMACLEAN(R)  
14 / 16
Sulfuric Acid Present Not Listed
Water Present Not Listed
Chromium Trioxide Present Not Listed

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Water</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

**EU Classification**

**R-phrase(s)**
R35 - Causes severe burns.
R45 - May cause cancer.
R62 - Possible risk of impaired fertility.
R46 - May cause heritable genetic damage.
R42/43 - May cause sensitization by inhalation and skin contact.

**S-phrase(s)**
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S30 - Never add water to this product.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S1/2 - Keep locked up and out of the reach of children.

**Components Classification Concentration Limits: Safety Phrases**

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>C; R35</td>
<td>15%&lt;=C; R:35 5%&lt;=C&lt;15%; Xi; R:36/38</td>
<td>S1/2 S26 S30 S45</td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>T; R24/25-48/23 T+; R26 C; R35 R42/43 Carc.Cat.1; R45 Muta.Cat.2; R46 N; R50-53 Repr.Cat.3; R62 O; R9</td>
<td>10%&lt;=C; R:35 5%&lt;=C&lt;10%; C; R:34 1%&lt;=C&lt;5%; Xi; R:36/37/38</td>
<td>S53 S45 S60 S61</td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

**Indication of danger:**
None.

**16. OTHER INFORMATION**

The MSDS format complies with ANSI Z400.1/Z129.1-2010 standards.

**Product code:** C-223  **Product name:** CHROMACLEAN(R)
All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.
SAFETY DATA SHEET

Preparation Date: 7/23/2014
Revision Date: 7/23/2014
Revision Number: G1

1. IDENTIFICATION

Product identifier
Product code: C-223
Product Name: CHROMACLEAN(R)

Other means of identification
Synonyms: No information available
CAS #: Mixture
RTECS #: Not available
CI#: Not available

Recommended use of the chemical and restrictions on use
Recommended use: No information available.
Uses advised against: No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA  90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com

Emergency telephone number
Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Regina Wachenheim (East Coast)

2. HAZARDS IDENTIFICATION

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Inhalation (Gases)</td>
</tr>
<tr>
<td>Acute toxicity - Inhalation (Vapors)</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
</tr>
<tr>
<td>Skin sensitization</td>
</tr>
<tr>
<td>Carcinogenicity</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
</tr>
<tr>
<td>Category 2</td>
</tr>
<tr>
<td>Category 2</td>
</tr>
<tr>
<td>Category 1Sub-category A</td>
</tr>
<tr>
<td>Category 1</td>
</tr>
<tr>
<td>Category 1</td>
</tr>
<tr>
<td>Category 1A</td>
</tr>
<tr>
<td>Category 2</td>
</tr>
</tbody>
</table>

Label elements
**Hazard statements**

Fatal if inhaled
Causes severe skin burns and eye damage
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
May cause cancer
Suspected of damaging fertility or the unborn child

**Precautionary Statements - Prevention**

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear respiratory protection
Wash face, hands and any exposed skin thoroughly after handling
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves

**Precautionary Statements - Response**

Specific treatment is urgent (see .? on this label)
Immediately call a POISON CENTER or doctor/physician
Specific treatment (see .? on this label)
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
If skin irritation or rash occurs: Get medical advice/attention
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

**Precautionary Statements - Storage**

Store locked up
Store in a well-ventilated place. Keep container tightly closed

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

---

**Hazards not otherwise classified (HNOC)**

Not Applicable

**Other hazards**

May be harmful if swallowed

**Product code:** C-223  
**Product name:** CHROMACLEAN(R)
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>7664-93-9</td>
<td>84-85</td>
<td>*</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>15-16</td>
<td>*</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>1333-82-0</td>
<td>0.5</td>
<td>*</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid measures

General Advice:
Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. First aider needs to protect himself.

Skin Contact:
Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician immediately.

Eye Contact:
Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation:
Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or 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. Immediate medical attention is required. Call a physician immediately.

Ingestion:
Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is conscious, give water or milk. Follow with Milk of Magnesia or egg whites beaten with water. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Most important symptoms and effects, both acute and delayed

Symptoms: Severe skin and eye irritation or burns. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic skin reaction.

Indication of any immediate medical attention and special treatment needed
Notes to Physician: Treat symptomatically

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.

Unsuitable Extinguishing Media: No information available.
Specific hazards arising from the chemical

Hazardous Combustion Products: No information available.

Specific hazards:

For Sulfuric Acid:
- Contact with metals may evolve flammable hydrogen gas
- Metal acetylides (Monocesium and Monorubidium), and carbides ignite with concentrated sulfuric acid.
- White Phosphorous + boiling Sulfuric acid or its vapor ignites on contact.
- May ignite other combustible materials.
- May cause fire when sulfuric acid is mixed with Cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorous (III) oxide, and oxidizing agents such as chlorates, halogens, permanganates.
- Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxycromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride, carbides, nitro compounds, nitrates, carbides, phosphorous, iodides, picrates, fulminates, dienes, alcohols (when heated)
- Nitramide decomposes explosively on contact with concentrated sulfuric acid.
- 1,3,5-Trinitrosohexahydro-1,3,5-triazine + sulfuric acid causes explosive decomposition.
- Containers may explode when heated or if contaminated with water
- Reaction with water may generate much heat which will increase the concentration of fumes in the air

Special Protective Actions for Firefighters

Specific Methods:
- Water mist may be used to cool closed containers. Do not use water on material itself. Do not get water inside containers. When material is not involved in a fire, do not use water on material itself. DO NOT use combustible materials such as sawdust.

Special Protective Equipment for Firefighters:
- As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions:
- Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing.

Environmental precautions
- Prevent further leakage or spillage if safe to do so. Should not be released into the environment. Do not let product enter drains. Do not flush into surface water or sanitary sewer system. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment
- Stop leak if you can do it without risk.

Product code: C-223 Product name: CHROMACLEAN(R)
Methods for cleaning up

Neutralize with Sodium carbonate or Sodium bicarbonate. Dilute with water. Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions:
Use only in area provided with appropriate exhaust ventilation. Do not allow contact with water. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:
Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. May corrode metallic surfaces. Do not store in uncoated metallic containers. Store in a segregated and approved area. Do not store near combustible materials. Store away from incompatible materials.

Incompatible Materials:

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid - 7664-93-9</td>
<td>1 mg/m³ TWA</td>
<td>1 mg/m³ TWA</td>
<td>0.2 mg/m³ TWA thoracic fraction</td>
<td>None</td>
</tr>
<tr>
<td>Water - 7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide - 1333-82-0</td>
<td>None</td>
<td>0.0002 mg/m³ TWA Cr</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Canada

<table>
<thead>
<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid - 7664-93-9</td>
<td>1 mg/m³ TWA</td>
<td>0.2 mg/m³ TWA thoracic</td>
<td>1 mg/m³ TWA EV</td>
<td>3 mg/m³ STEV</td>
</tr>
<tr>
<td>Water - 7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide - 1333-82-0</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Australia and Mexico

<table>
<thead>
<tr>
<th>Components</th>
<th>Australia</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid 7664-93-9</td>
<td>3 mg/m³ STEL</td>
<td>1 mg/m³ TWA</td>
</tr>
<tr>
<td>Water 7732-18-5</td>
<td>1 mg/m³ TWA</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide 1333-82-0</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Product code: C-223

Product name: CHROMACLEAN(R)
Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Face-shield.
Skin and body protection: Chemical resistant protective suit. Gloves. boots.
Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.
Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>Appearance:</th>
<th>Color:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>No information available</td>
<td>Red brown.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Odor:</th>
<th>Taste</th>
<th>Molecular/Formula weight:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odorless, but has a choking odor when hot.</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flash point (°C):</th>
<th>Flashpoint (°C/°F):</th>
<th>Flash Point Tested according to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No data available</td>
<td>No information available</td>
<td>Not available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lower Explosion Limit (%):</th>
<th>Upper Explosion Limit (%):</th>
<th>Autoignition Temperature (°C/°F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>pH:</th>
<th>Melting point/range(°C/°F):</th>
<th>Boiling point/range(°C/°F):</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decomposition temperature(°C/°F):</th>
<th>Specific gravity:</th>
<th>Density (g/cm3):</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available</td>
<td>1.5-1.6 (calculated)</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bulk density:</th>
<th>Vapor pressure @ 20°C (kPa):</th>
<th>Evaporation rate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vapor density:</th>
<th>VOC content (g/L):</th>
<th>Odor threshold (ppm):</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.37</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Partition coefficient (n-octanol/water):</th>
<th>Viscosity:</th>
<th>Miscibility:</th>
</tr>
</thead>
<tbody>
<tr>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

| Solubility: | |
|-------------| |
| Soluble in Water | |

10. STABILITY AND REACTIVITY

Reactivity
10. STABILITY AND REACTIVITY

For Sulfuric Acid:
Reacts violently with water
It reacts with alcohols and amines
Incompatible (can react explosively or dangerously) with the following: ACETIC ACID, ACRYLIC ACID, AMMONIUM HYDROXIDE, CRESOL, CUMENE, DICHLOROETHYL ETHER, ETHYLENE CYANOHYDRIN, ETHYLENEIMINE, NITRIC ACID, 2-NITROPROPANE, PROPYLENE OXIDE, SULFOLANE, VINYLIDENE CHLORIDE, DIETHYLENE GLYCOL MONOMETHYL ETHER, ETHYL ACETATE, ETHYLENE CYANOHYDRIN, ETHYLENE GLYCOL MONOETHYL ETHER ACETATE, GLYOXAL, METHYL ETHYL KETONE, dehydrating agents, organic materials, moisture (water), Acetic anhydride, Acetone, cyanohydrin, Acetone+nitric acid, Acetone + potassium dichromate, Acetonitrile, Acrolein, Acrylonitrile, Acrylonitrile+water, Alcohols + hydrogen peroxide, ally compounds such as Allyl alcohol, and Allyl Chloride, 2-Aminoethanol, Ammonium hydroxide, Ammonium triperchlorate, Aniline, Bromate + metals, Bromine pentfluoride, n-Butyraldehyde, Carbides, Cesium acetylene carbide, Chlorates, Cyclopentanone oxime, chlorinates, Chlorates + metals, Chlorine trifluoride, Chlorosulfonic acid, 2-cyano-4-nitrobenzenediazonium hydrogen sulfate, Cuprous nitride, p-chloronitrobenzene, 1,5-Dinitronaphthalene + sulfur, Disobutylylene, p-dimethylaminobenzaldehyde, 1,3-Diazobenzene, Dimethylbenzylicarbinol + hydrogen peroxide, Epichlorhydrin, Ethyl alcohol + hydrogen peroxide, Ethylene diamine, Ethylene glycol and other glycols, Ethyleneimine, Fulminates, hydrogen peroxide, Hydrochloric acid, Hydrofluoric acid, Iodine heptafluoride, Indane + nitric acid, Iron, Isoprene, Lithium silicide, Mercuric nitride, Mesityl oxide, Mercury nitride, Metals (powdered), Nitromethane, Nitric acid + glycrides, p-Nitrotoluene, Pentasilver trihydroxydiaminophosphate, Perchlorates, Perchloric acid, Permanganates + benzene, 1-Phenyl-2-methylpropyl alcohol + hydrogen peroxide, Phosphorus, Phosphorus isocyanate, Picrates, Potassium tert-butoxide, Potassium chlorate, Potassium Permanganate and other permanganates, halogens, amines, Potassium Permanganate + Potassium chloride, Perchlorates, Propiolactone (beta)-, Pyridine, Rubidium acetylene carbide, Silver permanganate, Sodium, Sodium carbonate, sodium hydroxide, Steel, styrene monomer, toluene + nitric acid, Vinyl acetate, Thalium (I) azidodithiocarbonate, Zinc chloride, Zinc iodide, azides, carbonates, cyanides, sulfides, sulfites, alkali hydrides, carboxylic acid anhydrides, nitriles, olefinic organics, aqueous acids, cyclopentadiene, cyano-alcohols, metal acetylides, Evolves flammable hydrogen gas on contact with metals
Concentrated sulfuric acid oxidizes, dehydrates, or sulfonates most organic compounds

Chemical stability
Stability: Stable at normal conditions

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Incompatible materials. Exposure to water.


Hazardous decomposition products: Sulphur oxides.

Other Information

Corrosivity:
For Sulfuric Acid:
Extremely corrosive in presence of aluminum
Extremely corrosive in presence of copper
Extremely corrosive in the presence of stainless steel (316)
Highly corrosive in the presence of stainless steel (304)
Non-corrosive in the presence of glass
Minor corrosive effect on bronze
Non-corrosive to lead and mild steel
No corrosion data on brass or zinc

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Skin. Inhalation. Ingestion.

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

Product code: C-223  Product name: CHROMACLEAN(R)
Component Information

Sulfuric Acid - 7664-93-9
- LD50/oral/rat = 2140 mg/kg Oral LD50 Rat
- LD50/oral/mouse = No information available
- LD50/dermal/rabbit = No information available
- LC50/inhalation/rat = 347 ppm 1 h
  510 mg/m³ Inhalation LC50 Rat 2 h
- LC50/inhalation/mouse = 320 mg/m³ Inhalation 2 h LC50 Mouse
- Other LD50 or LC50 information = No information available

Water - 7732-18-5
- LD50/oral/rat = > 90 mL/kg Oral LD50 Rat
- LD50/oral/mouse = No information available
- LD50/dermal/rabbit = No information available
- LC50/inhalation/rat = No information available
- LC50/inhalation/mouse = No information available
- Other LD50 or LC50 information = No information available

Chromium Trioxide - 1333-82-0
- LD50/oral/rat = 50-80 mg/kg Oral LD50 Rat
- LD50/oral/mouse = 127 mg/kg
- LD50/dermal/rabbit = 20 mg/kg Dermal LD50 Rabbit
- LD50/dermal/rat = =55 mg/kg Dermal LD50 Rat
- LC50/inhalation/rat = 0.217 mg/L Inhalation LC50 Rat 4 h
- LC50/inhalation/mouse = No information available
- Other LD50 or LC50 information = No information available

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = No information available

LD50/oral/mouse =
Value - Acute Tox Oral = No information available

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat
VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

Product code: C-223 Product name: CHROMACLEAN(R)
Symptoms

Skin Contact: Severe skin irritation. Causes skin burns. May cause sensitization by skin contact. May cause allergic skin reaction.

Eye Contact: Severe eye irritation. Causes eye burns.

Inhalation: Fatal if inhaled. Causes severe irritation of the respiratory tract and mucous membranes with sore throat, coughing, sneezing, shortness of breath, and delayed lung edema. Can cause chemical burns (corrosive action) to the respiratory tract and mucous membranes. Inhalation may be fatal as a result of bronchospasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory shock/collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Ischemic liver and heart lesions, kidney failure may occur several hours after unchecked circulatory collapse. Circulatory shock is often the immediate cause of death. May also affect teeth (changes in teeth and supporting structures - erosion, discoloration).

Ingestion: May be harmful if swallowed. Causes digestive or gastrointestinal tract burns. Corrosive to the mouth, throat, and stomach. May cause permanent damage to the digestive tract. May cause perforation of the digestive tract. May cause gastritis. May cause abdominal pain. Ingestion may cause nausea, vomiting. Vomit may resemble "coffee grounds". May cause metabolic acidosis.

Aspiration hazard: No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity: For Sulfuric Acid:
Inhalation: Prolonged or repeated inhalation may affect behavior (muscle contraction or spasticity), urinary system (kidney damage), and respiratory system/lungs (pulmonary edema, lung damage/changes in lung function with chronic bronchitis and emphysema), teeth (dental discoloration, erosion).
Skin: Prolonged or repeated skin contact may cause dermatitis.
Eyes: Conjunctivitis is also a common finding with chronic exposure.

For Chromium trioxide:
Protracted or prolonged contact may cause allergic contact dermatitis (allergic skin reaction). May also cause slow-healing skin ulcers ("chrome sores"), particularly if skin is broken.
Eyes: Repeated or prolonged eye contact may cause conjunctivitis.
Inhalation: Repeated or prolonged inhalation may cause allergic respiratory reaction. It may cause chronic respiratory tract irritation with chronic rhinitis, hyperemia, chronic catarrh, congestion of the larynx, inflammation of the larynx, polyps of the upper respiratory tract, chronic inflammation of the lungs, emphysema, tracheitis, chronic bronchitis, bronchospasm (asthma), chronic pharyngitis, bronchopneumonia, ulceration and perforation of the nasal septum.
Ingestion: Repeated or prolonged ingestion may cause nausea, vomiting, loss of appetite, kidney damage, inflammation of the liver or even hepatitis with jaundice, leukocytosis, leukopenia, monocytes, and eosinophilia.

Sensitization: May cause sensitization by inhalation and skin contact

Mutagenic Effects: For Chromium Trioxide
May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells
Mutagenic effects on mammalian germ cells

Product code: C-223  Product name: CHROMACLEAN(R)

9 / 16
Carcinogenic effects: For Sulfuric Acid: May cause cancer. However, evidence is inconclusive. Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC Group 1). However, this classification applies only to mists containing sulfuric acid generated during an industrial process and not to (almost) pure sulfuric acid or sulfuric acid solutions; The ACGIH has classified "strong inorganic acid mists containing sulfuric acid" as a suspected human carcinogen (ACGIH Group A2). However, this classification applies only to mists containing sulfuric acid generated during an industrial process and not to (almost) pure sulfuric acid or sulfuric acid solutions.

For Chromium Trioxide: Carcinogenic.

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH - Carcinogens</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>A2 Suspected Human Carcinogen (contained in strong inorganic acid mists)</td>
<td>Group 1 - Monograph 54 (1992) Occupational exposure to mists and vapours from sulfuric acid and other strong inorganic acids</td>
<td>Not listed</td>
<td>Present</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Water</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

ACGIH (American Conference of Governmental Industrial Hygienists)
IARC (International Agency for Research on Cancer)
NTP (National Toxicology Program)
OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity: Suspected of damaging fertility or the unborn child

Reproductive Effects: May cause adverse reproductive effects based on animal data. Possible risk of impaired fertility.

Developmental Effects: May cause developmental effects based on animal data. Possible risk of harm to the unborn child.

Product code: C-223
Product name: CHROMACLEAN(R)
Teratogenic Effects: For Sulfuric Acid:

Developmental effects and Teratogenicity: According the the Registry of Toxic Effects of Chemical Substances (RTECS reference - Murry et al, "Embryotoxicity of Inhaled Sulfuric Acid Aerosol in Mice and Rabbits", Journal of Environmental Science and Health, Part C, Vol. 13, pages 251-266, 1979), musculoskeletal developmental abnormalities were found in rabbits at a dose of 20 mg/m³ for 7 hrs. However, REPROTOX and Shepard's Catalog of Teratogenic Agents, citing this same study, stated that inhalation of sulfuric acid fumes did not increase congenital anomalies in the offspring of treated pregnant mice or rabbits. Furthermore, the Hazard Substance Data Bank (HSDB) also stated that in a developmental toxicity study conducted under a method similar to OECD test Guideline 414 that no significant effects on mean numbers of implants/dam, live fetuses/liter or resorptions/litter were observed in mice and rabbits exposed by inhalation to sulfuric acid aerosol at 5 and 20 mg/m³ during gestation and therefore could not be considered embryotoxic, or fetotoxic.

Specific Target Organ Toxicity

STOT - single exposure No information available
STOT - repeated exposure No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

Sulfuric Acid - 7664-93-9
Freshwater Fish Species Data: 500 mg/L LC50 Brachydanio rerio 96 h static 1

Chromium Trioxide - 1333-82-0
Freshwater Fish Species Data: 40 mg/L LC50 Colisa fasciatus 96 h static 1

Persistence and degradability: No information available
Bioaccumulative potential: No information available
Mobility: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Water</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Product code: C-223 Product name: CHROMACLEAN(R)
14. TRANSPORT INFORMATION

DOT
UN-No: UN1760
Proper Shipping Name: Corrosive liquids, n.o.s. (sulfuric acid)
Hazard Class: 8
Subsidiary Risk: Not applicable
Packing Group: II
Marine Pollutant: No data available
ERG No: 154
DOT RQ (lbs): No information available
Symbol(s): G

TDG (Canada)
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

ADR
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Packing Group: II
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Subsidiary Risk: 8
Packing Group: II
Classification Code: No information available
Description: No information available

ICAO
UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.

Product code: C-223  Product name: CHROMACLEAN(R)
14. TRANSPORT INFORMATION

Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
Description: No information available

IATA

UN-No: UN1760
Proper Shipping Name: Corrosive liquid, n.o.s.
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: II
ERG Code: 8L
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>KOREA KECL (PICCS)</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS (1)-724</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Present</td>
<td>Present KE-32570</td>
<td>Present</td>
<td>Present (1)-430</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-639-5</td>
</tr>
<tr>
<td>Water</td>
<td>Present</td>
<td>Present KE-35400</td>
<td>Present</td>
<td>Not present</td>
<td>Present</td>
<td>Present</td>
<td>Present 231-791-2</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Present R</td>
<td>Present KE-06020</td>
<td>Present</td>
<td>Present (1)-284</td>
<td>Present</td>
<td>Present</td>
<td>Present 215-607-8</td>
</tr>
</tbody>
</table>

U.S. Regulations

Sulfuric Acid

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
New Jersey (EHS) List: Present
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List: Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances: 1000 lb RQ; 100 lb RQ
Louisiana Reportable Quantity List for Pollutants: 1000lbfinal RQ; 454kgfinal RQ
California Directors List of Hazardous Substances: Present
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 184.1095

Chromium Trioxide

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: Present
Pennsylvania RTK: Special hazardous substance
Pennsylvania RTK - Special Hazardous Substances: Present


Chemicals Known to the State of California to Cause Cancer:
WARNING: This product contains a chemical known to the State of California to cause cancer. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Listed under strong inorganic mists containing sulfuric acid</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Water</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

Product code: C-223  Product name: CHROMACLEAN(R)
CERCLA/SARA

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>1000 lb final RQ</td>
<td>1000 lb TPQ</td>
<td>None</td>
<td>None</td>
<td>1.0 % de minimis concentration</td>
</tr>
<tr>
<td>Water</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Water</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
- E  Corrosive material
- D1A Very toxic materials
- D2A Very toxic materials
- D2B Toxic materials

Sulfuric Acid
- D1A  E including &gt;51%, &lt;=51%

Water
- Uncontrolled product according to WHMIS classification criteria

Chromium Trioxide
- C  D1A  D2A  D2B  E

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

<table>
<thead>
<tr>
<th>Components</th>
<th>WHMIS Ingredient Disclosure List -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>1 %</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>0.1 %</td>
</tr>
</tbody>
</table>

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Water</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CEPA Schedule I - Toxic Substances</th>
<th>CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Water</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Product code: C-223  Product name: CHROMACLEAN(R)
EU Classification

R-phrase(s)
R35 - Causes severe burns.
R45 - May cause cancer.
R62 - Possible risk of impaired fertility.
R46 - May cause heritable genetic damage.
R42/43 - May cause sensitization by inhalation and skin contact.

S-phrase(s)
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S30 - Never add water to this product.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 1/2 - Keep locked up and out of the reach of children.

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric Acid</td>
<td>C; R35</td>
<td>15% &lt;= C; C: R35</td>
<td>S1/2 S26 S30 S45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5% &lt;= C &lt; 15%; Xi; R:36/38</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
<tr>
<td>Chromium Trioxide</td>
<td>T; R24/25-48/23</td>
<td>10% &lt;= C; C: R35</td>
<td>S53 S45 S60 S61</td>
</tr>
<tr>
<td></td>
<td>T+: R26</td>
<td>5% &lt;= C &lt; 10%; C: R34</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C; R35</td>
<td>1% &lt;= C &lt; 5%; Xi; R:36/37/38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R42/43</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carc.Cat.1; R45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muta.Cat.2; R46</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N; R50-53</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repr.Cat.3; R62</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Q; R9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
None.

16. OTHER INFORMATION
Preparation Date: 7/23/2014
Revision Date: 7/23/2014
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Material Safety Data Sheet