SAFETY DATA SHEET

1. Identification

Product Name: Cleaning Solution
Cat No.: SC88-1; SC88-212; SC88-212E; SC88-500; SC88S-212; SC88S-500
Synonyms: Chromic acid-sulfuric acid
Recommended Use: Laboratory chemicals
Uses advised against: No Information available

Details of the supplier of the safety data sheet

Company: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

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

Skin Corrosion/irritation: Category 1 A
Serious Eye Damage/Eye Irritation: Category 1
Germ Cell Mutagenicity: Category 1B
Carcinogenicity: Category 1A
Specific target organ toxicity (single exposure): Category 3
Target Organs - Respiratory system.

Label Elements

Signal Word: Danger

Hazard Statements
Causes severe skin burns and eye damage
May cause respiratory irritation
May cause genetic defects
May cause cancer
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
Wash face, hands and any exposed skin thoroughly after handling
Use only outdoors or in a well-ventilated area

Response
Immediately call a POISON CENTER or doctor/physician

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

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

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

Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

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

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
Harmful to aquatic life with long lasting effects

Other hazards
May produce an allergic reaction. Water reactive.

Unknown Acute Toxicity
.? % of the mixture consists of ingredients of unknown toxicity.

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3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>7664-93-9</td>
<td>93.87</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>5.63</td>
</tr>
<tr>
<td>Chromium trioxide (CrO3)</td>
<td>1333-82-0</td>
<td>0.50</td>
</tr>
</tbody>
</table>

4. First-aid measures

General Advice
Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.
Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

Ingestion
Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects
Causes burns by all exposure routes. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

Notes to Physician
Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media
Dry chemical recommended.

Unsuitable Extinguishing Media
No information available.

Flash Point
Not applicable
Method -
No information available

Autoignition Temperature
No information available.

Explosion Limits
Upper
No data available
Lower
No data available

Sensitivity to Mechanical Impact
No information available

Sensitivity to Static Discharge
No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes.

Hazardous Combustion Products
Thermal decomposition can lead to release of irritating gases and vapors, Sulfur oxides, Chromium oxide.

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>2</td>
<td>W</td>
</tr>
</tbody>
</table>

6. Accidental release measures

Personal Precautions
Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions
Should not be released into the environment. Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. See Section 12 for additional ecological Information. Avoid release to the environment. Collect spillage.

Methods for Containment and Clean Up
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.
7. Handling and storage

Handling
Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Wear personal protective equipment. Do not breathe vapors or spray mist. Do not ingest.

Storage
Corrosives area.

8. Exposure controls / personal protection

Exposure Guidelines
This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>TWA: 0.2 mg/m³</td>
<td>(Vacated) TWA: 1 mg/m³</td>
<td>IDLH: 15 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 1 mg/m³</td>
</tr>
<tr>
<td>Chromium trioxide (CrO₃)</td>
<td>TWA: 0.05 mg/m³</td>
<td>(Vacated) Ceiling: 0.1 mg/m³</td>
<td>IDLH: 15 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA: 0.0002 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Quebec TWA</th>
<th>Mexico OEL (TWA)</th>
<th>Ontario TWAEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
</tr>
<tr>
<td></td>
<td>STEL: 3 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromium trioxide (CrO₃)</td>
<td>TWA: 0.05 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.05 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 0.05 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Legend
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures
Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection
Tightly fitting safety goggles. Face-shield.

Skin and body protection
Long sleeved clothing.

Respiratory Protection
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State
Liquid

Appearance
Dark brown

Odor
Odorless

Odor Threshold
No information available.

pH
2.0 Acidic

Melting Point/Range
-5°C / 23°F

Boiling Point/Range
290°C / 554°F

Flash Point
Not applicable

Evaporation Rate
No information available.

Flammability (solid,gas)
Not applicable

Flammability or explosive limits
Upper
No data available

Lower
No data available

Vapor Pressure
.001 mmHg @ 20 °C

Vapor Density
No information available.
9. Physical and chemical properties

Relative Density
Solubility
Partition coefficient; n-octanol/water
Autoignition Temperature
Decomposition temperature
Viscosity

10. Stability and reactivity

Reactive Hazard
Stability
Conditions to Avoid
Incompatible Products
Incompatible Materials
Hazardous Decomposition Products
Hazardous Polymerization
Hazardous Reactions

11. Toxicological information

Acute Toxicity
Product Information
Oral LD50
Dermal LD50
Vapor LC50

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral Oral LD50</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>2140 mg/kg (Rat)</td>
<td>Not listed</td>
<td>510 mg/m³ (Rat) 2 h</td>
</tr>
<tr>
<td>Water</td>
<td>-</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Chromium trioxide (CrO3)</td>
<td>50 mg/kg (Rat)</td>
<td>55 mg/kg (Rabbit)</td>
<td>0,217 mg/L (Rat) 4 h</td>
</tr>
</tbody>
</table>

Toxicologically Synergistic Products

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

Irritation
Sensitization
Carcinogenicity

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>7664-93-9</td>
<td>Group 1</td>
<td>Not listed</td>
<td>A2</td>
<td>X</td>
<td>A2</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Chromium trioxide (CrO3)</td>
<td>1333-82-0</td>
<td>Group 1</td>
<td>Known</td>
<td>A1</td>
<td>X</td>
<td>A1</td>
</tr>
</tbody>
</table>
IARC: (International Agency for Research on Cancer)  
Group 1 - Carcinogenic to Humans  
Group 2A - Probably Carcinogenic to Humans  
Group 2B - Possibly Carcinogenic to Humans  

NTP: (National Toxicity Program)  
Known - Known Carcinogen  
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen  

ACGIH: (American Conference of Governmental Industrial Hygienists)  
A1 - Known Human Carcinogen  
A2 - Suspected Human Carcinogen  
A3 - Animal Carcinogen  

Mexico - Occupational Exposure Limits - Carcinogens  
A1 - Confirmed Human Carcinogen  
A2 - Suspected Human Carcinogen  
A3 - Confirmed Animal Carcinogen  
A4 - Not Classifiable as a Human Carcinogen  
A5 - Not Suspected as a Human Carcinogen  

Mutagenic Effects  
No information available.  
Reproductive Effects  
No information available.  
Developmental Effects  
No information available.  
Teratogenicity  
No information available.  
STOT - single exposure  
Respiratory system.  
STOT - repeated exposure  
None known.  
Aspiration hazard  
No information available.  
Symptoms / effects, both acute and delayed  
Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.  
Endocrine Disruptor Information  
No information available  
Other Adverse Effects  
The toxicological properties have not been fully investigated.  

12. Ecological information  

Ecotoxicity  
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not allow material to contaminate ground water system. The product contains following substances which are hazardous for the environment.  

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>-</td>
<td>500 mg/L LC50 96 h</td>
<td>-</td>
<td>EC50: 29 mg/L/24h</td>
</tr>
<tr>
<td>Chromium trioxide (CrO3)</td>
<td>Not listed</td>
<td>40 mg/L LC50 96 h</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Persistence and Degradability  
May persist, based on information available.  
Bioaccumulation/ Accumulation  
No information available  
Mobility  
Will likely be mobile in the environment due to its water solubility.  

13. Disposal considerations  

Waste Disposal Methods  
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.
14. Transport information

DOT

UN-No: UN3264
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC,N.O.S.
Hazard Class: 8
Packing Group: II

TDG

UN-No: UN3264
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC,N.O.S.
Hazard Class: 8
Packing Group: II

IATA

UN-No: UN3264
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC,N.O.S.
Hazard Class: 8
Packing Group: II

IMDG/IMO

UN-No: UN3264
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, INORGANIC,N.O.S.
Hazard Class: 8
Packing Group: II

15. Regulatory information

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>231-639-5</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Water</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>231-791-2</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>Chromium trioxide (CrO3)</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>15-607-9</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend:
X - Listed  
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA 12(b)</th>
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</thead>
<tbody>
<tr>
<td>Chromium trioxide (CrO3)</td>
<td>Section 6</td>
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</tbody>
</table>
### SARA 313

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid</td>
<td>7664-93-9</td>
<td>93.87</td>
<td>1.0</td>
</tr>
<tr>
<td>Chromium trioxide (CrO3)</td>
<td>1333-82-0</td>
<td>0.50</td>
<td>0.1</td>
</tr>
</tbody>
</table>

### SARA 311/312 Hazardous Categorization

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Clean Water Act

Not applicable

### Clean Air Act

Not applicable

### OSHA Occupational Safety and Health Administration

Not applicable

### CERCLA

Not Applicable

### California Proposition 65

This product does not contain any Proposition 65 chemicals.

### State Right-to-Know

Not applicable

### U.S. Department of Transportation

- **Reportable Quantity (RQ):** N
- **DOT Marine Pollutant:** N
DOT Severe Marine Pollutant  N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade  No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
E  Corrosive material
D1A  Very toxic materials
D2A  Very toxic materials

16. Other information

Prepared By  Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Revision Date  10-Apr-2014
Print Date  10-Apr-2014
Revision Summary  This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of SDS