SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Digestion Solution for COD 3-150 mg/l Range
Catalog Number: 2125815

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
P.O.Box 389 (Medical and Transportation)
Loveland, CO USA 80539 (303) 623-5716 24 Hour Service
(970) 669-3050 (515) 232-2533 8am - 4pm CST

MSDS Number: M00486
Chemical Name: Not applicable
CAS Number: Not applicable
Additional CAS No. (for hydrated forms): Not applicable
Chemical Formula: Not applicable
Chemical Family: Mixture
Intended Use: Determination of Chemical Oxygen Demand Laboratory Use

2. HAZARDS IDENTIFICATION

GHS Classification:
Hazard categories: Corrosive to Metals: Met. Corr. 1 Acute Toxicity: Acute Tox. 4-Orl Skin Corrosion/Irritation: Skin Corr. 1A Hazardous to the Aquatic Environment: Aquatic Chronic 1

GHS Label Elements:
DANGER

Hazard statements: May be corrosive to metals. Harmful if swallowed. Causes severe skin burns and eye damage. Very toxic to aquatic life with long lasting effects.

Precautionary statements: Wear protective gloves / protective clothing / eye protection / face protection. Do not eat, drink or smoke when using this product. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. 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. Absorb spillage to prevent material damage.

HMIS:
Health: 3
Flammability: 0
Reactivity: 2
Protective Equipment: X - See protective equipment, Section 8.

NFPA:
Health: 3
Flammability: 0
Reactivity: 2
Symbol: Water Reactive

WHMIS Hazard Classification: Class D, Division 1, Subdivision A - Very toxic materials (immediate effects) Class D, Division 2, Subdivision A - Very toxic materials (other toxic effects) Class E - Corrosive material

WHMIS Symbols: Acute Poison Corrosive
3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Components according to GHS:

**Sulfuric Acid**

- **CAS Number:** 7664-93-9
- **Chemical Formula:** H₂SO₄
- **GHS Classification:** Met. Corr. 1 H290; Skin Corr. 1A, H314; Aquatic Acute 3, H402
- **Percent Range:** 80.0 - 90.0
- **Percent Range Units:** weight / weight
- **PEL:** 1 mg/m³
- **TLV:** 1 mg/m³

**WHMIS Symbols:** Acute Poison Corrosive

**Mercuric Sulfate**

- **CAS Number:** 7783-35-9
- **Chemical Formula:** HgSO₄
- **GHS Classification:**
- **Percent Range:** < 1.0
- **Percent Range Units:** weight / weight
- **PEL:** 2 mg Hg/m³
- **TLV:** Skin: 0.025 mg Hg/m³

**WHMIS Symbols:** Acute Poison Corrosive

**Silver Sulfate**

- **CAS Number:** 10294-26-5
- **Chemical Formula:** Ag₂SO₄
- **GHS Classification:** Eye Dam. 1, H318; Aquatic Chronic 1, H410
- **Percent Range:** < 1.0
- **Percent Range Units:** weight / weight
- **PEL:** 0.01 mg/m³ (Ag)
- **TLV:** 0.01 mg/m³ (Ag)

**WHMIS Symbols:** Not applicable

**Dichromic Acid**

- **CAS Number:** 13530-68-2
- **Chemical Formula:** H₂Cr₂O₇
- **GHS Classification:** Ox. Sol. 2, H272; Acute Tox. 3-Orl, H301; Acute Tox. 4-Derm, H312; Skin Corr. 1B, H314; Acute Tox. 2-Inh, H330; Muta. 1B, H350; Repr. 1B, H360; STOT Rep. 1, H372; Aquatic Chronic 1, H410
- **Percent Range:** < 0.1
- **Percent Range Units:** weight / weight
- **PEL:** 5 µg/m³ (0.00235 ppm Cr³⁺), 8 Hr TWA; Action Level is 2.5 µg/m³ (0.00117 ppm), 8 Hr TWA
- **TLV:** 0.05 mg/m³ (0.0235 ppm as Cr³⁺)

**WHMIS Symbols:** Corrosive Oxidizing Acute Poison

Hazardous Components according to GHS: No

**Demineralized Water**

- **CAS Number:** 7732-18-5
- **Chemical Formula:** H₂O
- **GHS Classification:** Not a dangerous substance according to GHS.
- **Percent Range:** 10-15
- **Percent Range Units:** weight / weight
- **PEL:** Not established
- **TLV:** Not established

**WHMIS Symbols:** Not applicable
4. FIRST AID MEASURES

General Information: In the event of exposure, show this Material Safety Data Sheet and label (where possible) to a doctor.

Advice to doctor: Treat symptomatically.

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Remove contaminated clothing. Wash skin with soap and plenty of water. Call physician immediately.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

Ingestion (First Aid): Never give anything by mouth to an unconscious person. Do not induce vomiting. Give large quantities of water. Call physician immediately.

5. FIRE FIGHTING MEASURES

Flammable Properties: Not Flammable, but reacts with most metals to form flammable hydrogen gas. During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance. Water runoff can cause environmental damage. Dike and collect water used to fight fire.

Extinguishing Media: Use media appropriate to surrounding fire conditions

Extinguishing Media NOT To Be Used: Not applicable

Fire / Explosion Hazards: Contact with metals gives off hydrogen gas which is flammable. May react violently with:

- strong bases
- water

Hazardous Combustion Products: This material will not burn.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:
Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Containment Technique: Releases of this material may contaminate the environment. Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment. Dike the spill to contain material for later disposal.

Clean-up Technique: Mercury and its compounds are extremely toxic! Be extremely careful not to contact the spill or breathe any vapors. If permitted by regulation, Absorb spilled liquid with non-reactive sorbent material. Dispose of all mercury contaminated material at a government approved hazardous waste facility. Otherwise, Dispose of material in government approved hazardous waste facility. Decontaminate area with commercially available mercury absorbing compounds.

Evacuation Procedure: Evacuate general area (50 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. Deny access to unnecessary and unprotected personnel. Remain up-wind from spilled material. If conditions warrant, increase the size of the evacuation.

DOT Emergency Response Guide Number: 137

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes skin clothing. Do not breathe mist or vapors. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: light contamination by organic materials (will affect product stability) heat

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Use a fume hood to avoid exposure to dust, mist or vapor. Maintain adequate ventilation to keep exposure levels below the published exposure limits for chemicals in this product. Refer to the OSHA Standard at 29CFR1910.1026 for Cr (VI) (See Federal Register 28 February 2006 Page 10100.)

Personal Protective Equipment:

Eye Protection: chemical splash goggles
Skin Protection: nitrile gloves. In the EU, the selected gloves must satisfy the specifications of EU Directive 89/686/EEC and standard EN 374 derived from it. Lab coat.

Inhalation Protection: laboratory fume hood and/or adequate ventilation.


TLV: Not established.

PEL: Not established.

For Occupational Exposure Limits (OEL) for ingredients, see section 3 - Composition/Information on Ingredients.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Turbid, light orange liquid.
Physical State: Liquid.
Molecular Weight: Not applicable.
Odor: Odorless.
Odor Threshold: Not applicable.
pH: < 0.5.

Metal Corrosivity:
- Corrosivity Classification: Classified as corrosive to metals.
- Steel: 0.192 in/yr (4.88 mm/yr).
- Aluminum: 2.18 in/yr (55.4 mm/yr).

Specific Gravity/ Relative Density (water = 1; air =1): ~ 1.78.
Viscosity: ~ 25 cP.
Solubility:
- Water: Miscible.
- Acid: Not determined.
- Other: Not determined.

Partition Coefficient (n-octanol / water): Not applicable.
Coefficient of Water/Oil: Not applicable.

Melting Point: ~ 4 °C (40 °F).
Decomposition Temperature: Sulfuric acid slowly decomposes above 300 °C (572 °F).
Boiling Point: ~ 232 °C (~ 450 °F).

Flash Point: Not applicable.

Flammability Limits:
- Lower Explosion Limits: Not applicable.
- Upper Explosion Limits: Not applicable.

Autoignition Temperature: Not applicable.

Explosive Properties: Not classified according to GHS criteria.

Oxidizing Properties: Not classified according to GHS criteria.

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

Gas under Pressure: Not classified according to GHS criteria.

Not classified as gas under pressure according to GHS.

10. STABILITY AND REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Mechanical Impact: None reported.

Static Discharge: None reported.
Reactivity / Incompatibility: May react violently in contact with: caustics Incompatible with: metals
Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: mercury compounds sulfur oxides
Conditions to Avoid: Exposure to light or contamination by organic materials will affect this product's stability.

11. TOXICOLOGICAL INFORMATION

Toxicokinetics, Metabolism and Distribution: No information available for mixture.
Toxically Synergistic Products: None reported
Acute Toxicity: Acute Toxicity Estimate (ATE) - Calculated from Ingredient Toxicity Data Route Data Given Below
Outside testing: Oral Rat (male) LD$_{50}$ = 428 mg/kg; Oral Rat (female) LD$_{50}$ = 360 mg/kg
ATE Inhalation Rat LC$_{50}$ =35.5 mg/m$^3$
Specific Target Organ Toxicity - Single Exposure (STOT-SE): Based on classification principles, the classification criteria are not met.
Specific Target Organ Toxicity - Repeat Exposure (STOT-RE): Based on classification principles, the classification criteria are not met.
Skin Corrosion/Irritation: Corrosive to skin.
Eye Damage: Corrosive to eyes.
Sensitization: Based on classification principles, the classification criteria are not met.
CMR Effects/Properties (carcinogenic, mutagenic or toxic to reproduction): Based on classification principles, the classification criteria are not met. Contains Listed Carcinogen Contains a reproductive toxin.
Contains Chromic acid
An ingredient of this mixture is: IARC Group 1: Recognized Carcinogen
Hexavalent Chromium Compounds Sulfuric Acid - The IARC evaluation was based on exposure to the mist or vapor of concentrated sulfuric acid generated during chemical processes.
An ingredient of this mixture is: NTP Listed Group 1: Recognized Carcinogen
Hexavalent Chromium Compounds Sulfuric Acid Mist or Vapor
An ingredient of this product is an OSHA listed carcinogen.
Hexavalent chromium (Cr$^{6+}$) compounds
Symptoms/Effects:
Ingestion: Harmful Causes: abdominal pain circulatory disturbances diarrhea loosening of the teeth nausea vomiting rapid pulse and respirations toxic nephritis (inflammation of the kidneys) shock collapse kidney damage death
Inhalation: Causes: burning sensation May cause: severe burns difficult breathing mouth soreness teeth erosion
Effects similar to those of ingestion. Inhalation of mists / sprays: Can cause: asthma cancer
Skin Absorption: Toxic Will be absorbed through the skin. Effects similar to those of ingestion
Chronic Effects: Chronic overexposure may cause destruction of any tissue contacted erosion of the teeth mouth soreness chronic irritation or inflammation of the lungs accumulation of silver in body tissues which causes a slate-gray to bluish discoloration. Chromate and dichromate salts may cause ulceration and perforation of the nasal septum, severe liver damage, central nervous system effects, and lung cancer. Mercury is a general protoplasmic poison; it circulates in the blood and is stored in the liver, kidneys, spleen and bones. Main symptoms are sore mouth, tremors and psychic disturbances.
Medical Conditions Aggravated: Pre-existing: Eye conditions Skin conditions Respiratory conditions Allergies or sensitivity to chromates or chromic acid. Allergies or sensitivity to mercury.

12. ECOLOGICAL INFORMATION

Product Ecological Information:
No ecological data available for this product. Mobility in soil: Highly mobile Do not place in landfill. Recycle appropriately. Do not release into the environment.
Method Used for Estimation of Aquatic Toxicity of Mixture Summation Method M-factor (Multiplier) for highly toxic ingredients: 100
Ingredient Ecological Information: Silver sulfate: 48 hr Crustacean EC$_{50}$ = 0.0045 mg/L; 48 hr Daphnia magna EC$_{50}$ = 0.8 mg/L. Chromic acid: LC$_{50}$ = 0.0031 mg/L. Mercuric sulfate: Pseudokirchneriella subcapitata ErC$_{50}$ = 0.033 mg/L/14 d; Oncorhynchus gorbuscha LC$_{50}$ = 0.14 mg/L/7 d
CEPA categorization for ingredients are as follows:
Chromic acid, Silver sulfate, Mercuric sulfate: Persistent and inherently toxic to aquatic organisms.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: D002 D007 D009 D011
**Special Instructions (Disposal):** Dispose of all mercury contaminated material at an E.P.A. hazardous waste facility. Dispose of material in an E.P.A. approved hazardous waste facility. Empty Containers: Rinse three times with an appropriate solvent. Collect rinsate and dispose of according to local, state or federal regulations. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste. In the US, rinsate from empty containers is classified as hazardous waste and should be disposed of at an E.P.A. approved facility.

**NOTICE (Disposal):** These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information. In Europe: Chemical and analysis solutions must be disposed of in compliance with the respective national regulations. Product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system.

**14. TRANSPORT INFORMATION**

**D.O.T.:**
- **D.O.T. Proper Shipping Name:** Sulphuric Acid
- **Hazard Class:** 8
- **Subsidiary Risk:** NA
- **ID Number:** UN1830
- **Packing Group:** II

**T.D.G.:**
- **Proper Shipping Name:** Sulphuric Acid Solution
- **Hazard Class:** 8
- **Subsidiary Risk:** NA
- **UN Number/PIN:** 1830
- **Packing Group:** II

**I.C.A.O.:**
- **I.C.A.O. Proper Shipping Name:** Sulphuric Acid
- **Hazard Class:** 8
- **Subsidiary Risk:** NA
- **ID Number:** UN1830
- **Packing Group:** II

**I.M.O.:**
- **Proper Shipping Name:** Sulphuric Acid
- **Hazard Class:** 8
- **Subsidiary Risk:** NA
- **ID Number:** UN1830
- **Packing Group:** II

**Additional Information:** There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

**15. REGULATORY INFORMATION**

**U.S. Federal Regulations:**
- **O.S.H.A.:** This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)
- **E.P.A.:**
  - **S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370):** Immediate (Acute) Health Hazard Delayed (Chronic) Health Hazard Reactive
  - **S.A.R.A. Title III Section 313 (40 CFR 372):** This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA. Mercury compounds, Silver compounds, Sulfuric acid (acid aerosols including mists, vapors, gas, fog and other airborne forms).
    - 302 (EHS) TPQ (40 CFR 355): Sulfuric Acid 1000 lbs.
    - 304 CERCLA RQ (40 CFR 302.4): Chronic acid and Mercuric sulfate (each) = 10 lbs. Sulfuric Acid 1000 lbs.

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

State Regulations:
California Prop. 65: WARNING - This product contains a chemical known to the State of California to cause cancer. WARNING - This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Identification of Prop. 65 Ingredient(s): Chromium (hexavalent compounds);  Mercury and mercury compounds.

California Perchlorate Rule CCR Title 22 Chap 33: No

Trade Secret Registry: Not applicable

National Inventories:
U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).
CAS Number: Not applicable
Canadian Inventory Status: All ingredients of this product are listed.
EEC Inventory Status: All ingredients used to make this product are listed on EINECS / ELINCS.
Australian Inventory (AICS) Status: Not applicable
New Zealand Inventory (NZIoC) Status: All components either listed or exempt.
Korean Inventory (KECI) Status: All components of this product are either listed, listed as the anhydrous compound or exempt.
Japan (ENCS) Inventory Status: All components either listed or exempt.
China (PRC) Inventory (MEP) Status: All components either listed or exempt.

16. OTHER INFORMATION


Complete Text of H phrases referred to in Section 3: H290 May be corrosive to metals. H302 Harmful if swallowed. H311 Toxic in contact with skin. H314 Causes severe skin burns and eye damage. H373 May cause damage to organs through prolonged or repeated exposure. H410 Very toxic to aquatic life with long lasting effects.

Revision Summary: Substantial revision to comply with EU Reg 1272/2008, Reg 1907/2006 and UN GHS (ST/SG/AC.10/36/Add.3). 

Date of MSDS Preparation:
Day: 12
Month: January
Year: 2015

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

CCHOIS Evaluation Note: This product has been classified and labeled in accordance with the requirements of GHS (ST/SG/AC.10/36/Add.3). It is offered under the interim policy that was established by Health Canada permitting use of GHS-formatted safety data sheets in Canada prior to revision of CPR to GHS. It is offered under exemption from WHMIS labeling as specified in the Controlled Products Regulation (CPR) Section 17.

Legend:
NA - Not Applicable  w/w - weight/weight
ND - Not Determined  w/v - weight/volume
NV - Not Available  v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.
THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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