

## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** High Range Plus COD Reagent 0-15,000 ppm Range  
**Catalog Number:** 2415915

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

Emergency Telephone Numbers:  
(Medical and Transportation)  
(303) 623-5716 24 Hour Service  
(515)232-2533 8am - 4pm CST

**MSDS Number:** M00525  
**Chemical Name:** Not applicable  
**CAS Number:** Not applicable  
**Additional CAS No. (for hydrated forms):** Not applicable  
**Chemical Formula:** Not applicable  
**Chemical Family:** Not applicable  
**Intended Use:** Laboratory Use Determination of Chemical Oxygen Demand

### 2. HAZARDS IDENTIFICATION

#### GHS Classification:

**Hazard categories:** Acute Toxicity: Acute Tox. 4-Orl Acute Toxicity: Acute Tox. 3-Derm Skin Corrosion/Irritation: Skin Corr. 1A Germ Cell Mutagenicity: Muta. 1B Carcinogenicity: Carc. 1A Specific Target Organ Toxicity - Repeated Exposure: STOT RE. 2 Hazardous to the Aquatic Environment: Aquatic Chronic 1

#### GHS Label Elements:



**Hazard statements:** May be corrosive to metals. Harmful if swallowed. Toxic in contact with skin. Causes severe skin burns and eye damage. May cause genetic defects. May cause cancer. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life with long lasting effects.

**Precautionary statements:** Obtain special instructions before use. Wear protective gloves / protective clothing / eye protection / face protection. IF SWALLOWED: rinse mouth. Do NOT induce vomiting. 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. IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

#### 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

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

*Hazardous Components according to GHS:*

**Sulfuric Acid**

**CAS Number:** 7664-93-9

**Chemical Formula:** H<sub>2</sub>SO<sub>4</sub>

**GHS Classification:** Met. Corr. 1 H290; Skin Corr. 1A, H314

**Percent Range:** 60.0 - 70.0

**Percent Range Units:** weight / weight

**PEL:** 1 mg/m<sup>3</sup>

**TLV:** 1 mg/m<sup>3</sup> (TWA); 3 mg/m<sup>3</sup> (STEL)

**Mercuric Sulfate**

**CAS Number:** 7783-35-9

**Chemical Formula:** HgSO<sub>4</sub>

**GHS Classification:** Acute Tox. Inh. 2, H330; Acute Tox Der. 1, H310; Acute Tox. Orl. 2, H300; STOT RE 2, H373X, Aquatic Acute 1, H400; Aquatic Chronic 1, H410

**Percent Range:** 0.1 - 1.0

**Percent Range Units:** weight / weight

**PEL:** 0.1 mg/m<sup>3</sup> (Hg)

**TLV:** 0.05 mg/m<sup>3</sup> (Hg)

**Chromic Acid**

**CAS Number:** 13530-68-2

**Chemical Formula:** H<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>

**GHS Classification:** Ox. Sol.2,H272; Carc.1B,H350; Muta.1B, H340; Repr.1B, H360FD; Acute Tox.2-Inh, H330; Acute Tox.3-Orl, H301; Acute Tox.4-Derm, H312; STOT RE 1, H372; Skin Corr.1B, H314; Resp. Sens.1, H334; Skin Sens.1, H317; Aquatic Acute 1, H400; Aquatic Chronic 1, H410

**Percent Range:** 0.1 - 1.0

**Percent Range Units:** weight / weight

**PEL:** 5 µg/m<sup>3</sup> (0.00235 ppm Cr<sup>+6</sup>), 8 Hr TWA; Action Level is 2.5 µg/m<sup>3</sup> (0.00117 ppm), 8 Hr TWA

**TLV:** 0.05 mg/m<sup>3</sup> (0.0235 ppm as Cr<sup>+6</sup>)

**Silver Sulfate**

**CAS Number:** 10294-26-5

**Chemical Formula:** Ag<sub>2</sub>SO<sub>4</sub>

**GHS Classification:** Eye Dam.1, H318; Aquatic Acute 1, H400

**Percent Range:** 0.1 - 1.0

**Percent Range Units:** weight / weight

**PEL:** 0.01 mg/m<sup>3</sup> (Ag)

**TLV:** 0.01 mg/m<sup>3</sup> (Ag)

*Hazardous Components according to GHS: No*

**Demineralized Water**

**CAS Number:** 7732-18-5

**Chemical Formula:** H<sub>2</sub>O

**GHS Classification:** Not applicable

**Percent Range:** 30.0 - 40.0

**Percent Range Units:** weight / weight

**PEL:** Not established

**TLV:** Not established

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## 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):** Wash skin with plenty of water for 15 minutes. Remove contaminated clothing. Call physician immediately.

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

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

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## 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.

**Extinguishing Media:** Use media appropriate to surrounding fire conditions

**Extinguishing Media NOT To Be Used:** Not applicable

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

**Hazardous Combustion Products:** This material will not burn.

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## 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. Stop spilled material from being released to the environment. Absorb spilled liquid with non-reactive sorbent material. 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. Absorb spilled liquid with non-reactive sorbent material. Dispose of all mercury contaminated material at a government approved hazardous waste facility. 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:** 154

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## 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 Store at 10 - 30°C.

**Flammability Class:** Not applicable

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering Controls:** Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product. 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:** disposable latex gloves lab coat

**Inhalation Protection:** laboratory fume hood

**Precautionary Measures:** Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Use with adequate ventilation. Protect from: light organic materials heat Keep away from: alkalies metals other combustible materials oxidizers reducers

**TLV:** Not established. 0.05 mg/m<sup>3</sup> (0.0235 ppm as Cr<sup>+6</sup>).

**PEL:** Not established

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

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Turbid, light orange liquid

**Physical State:** Liquid

**Molecular Weight:** Not applicable

**Odor:** None

**Odor Threshold:** Not applicable

**pH:** < 0.5

**Metal Corrosivity:**

**Corrosivity Classification:** Classified as corrosive to metals.

**Steel:** 0.163 in/yr (4.14 mm/yr)

**Aluminum:** 3.92 in/yr (99.6 mm/yr)

**Specific Gravity/ Relative Density (water = 1; air =1):** 1.550

**Viscosity:** Not determined

**Solubility:**

**Water:** Miscible

**Acid:** Not determined

**Other:** Not determined

**Partition Coefficient (n-octanol / water):** Not applicable

**Coefficient of Water / Oil:** Not applicable

**Melting Point:** freezes at -72°C (-98°F)

**Decomposition Temperature:** Not determined

**Boiling Point:** 99°C (210°F)

**Vapor Pressure:** Not determined

**Vapor Density (air = 1):** Not determined

**Evaporation Rate (water = 1):** Not determined

**Volatile Organic Compounds Content:** None

**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.

**Flash Point:** Not applicable

**Method:** 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 as gas under pressure according to GHS.

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## 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

**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.

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## 11. TOXICOLOGICAL INFORMATION

**Toxicokinetics, Metabolism and Distribution:** No information available for mixture.

**Toxicologically Synergistic Products:** None reported

**Acute Toxicity:** Acute Toxicity Estimate (ATE) - Calculated from Ingredient Toxicity Data

Oral LD50 = 667 mg/kg.

Dermal LD50 = 828 mg/kg.

Inhalation LC50 = 44 mg/L

**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):** Target Organs Respiratory Tract Kidneys Liver Reproductive system Central nervous system

**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):** Contains Listed Carcinogen Data supporting mutagenicity was found.

NTP Listed Group 1: Recognized Carcinogen

Hexavalent Chromium Compounds

An ingredient of this product is an OSHA listed carcinogen.

Hexavalent chromium (Cr<sup>6</sup>) compounds

**Symptoms/Effects:**

**Ingestion:** Causes: May cause: severe burns 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:** Toxic Causes: severe burns May cause: difficult breathing mouth soreness teeth erosion Effects similar to those of ingestion.

**Skin Absorption:** 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. cancer

**Medical Conditions Aggravated:** Pre-existing: Eye conditions Skin conditions Respiratory conditions Allergies or sensitivity to chromates or chromic acid.

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## 12. ECOLOGICAL INFORMATION

**Product Ecological Information:** Calculated: Crustacea 48 hr EC50 = 0.0045 mg/L

Mobility in soil: No data available

Method Used for Estimation of Aquatic Toxicity of Mixture M-factor (Multiplier) for highly toxic ingredients: 100

**Ingredient Ecological Information:** Silver sulfate: Crustacea 48 hr EC50 = 0.0045 mg/L; mercuric sulfate: Algae: EC50 - Pseudokirchneriella subcapitata - 0.033 mg/L - 14 d; chromic acid: Daphnia magna (Water flea) 48 hr EC50 = 0.8 mg/L

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## 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. Dispose of empty container as normal trash. Rinsate from empty containers may contain sufficient product to require disposal as hazardous waste.

**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.

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## 14. TRANSPORT INFORMATION

**D.O.T.:**

**D.O.T. Proper Shipping Name:** Corrosive Liquid, Acidic, Inorganic, N.O.S.  
(Sulphuric Acid/Chromic Acid Solution)

**Hazard Class:** 8

**Subsidiary Risk:** NA

**ID Number:** UN3264

**Packing Group:** II

**T.D.G.:**

**Proper Shipping Name:** Corrosive Liquid, Acidic, Inorganic, N.O.S.

(Sulphuric Acid/Chromic Acid Solution)

**Hazard Class:** 8

**Subsidiary Risk:** NA

**UN Number/PIN:** 3264

**Packing Group:** II

**I.C.A.O.:**

**I.C.A.O. Proper Shipping Name:** Corrosive Liquid, Acidic, Inorganic, N.O.S.

(Sulphuric Acid/Chromic Acid Solution)

**Hazard Class:** 8

**Subsidiary Risk:** NA

**ID Number:** UN3264

**Packing Group:** II

**I.M.O.:**

**Proper Shipping Name:** Corrosive Liquid, Acidic, Inorganic, N.O.S.

(Sulphuric Acid/Chromic Acid Solution)

**Hazard Class:** 8

**Subsidiary Risk:** NA

**ID Number:** UN3264

**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.

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## 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):** Immédiat (aigu) Danger pour la santé 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, Chromium 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):** Chromic acid and Mercuric sulfate (each) = 10 lbs. Sulfuric Acid 1000 lbs.

**304 EHS RQ (40 CFR 355):** Sulfuric Acid - RQ 1000 lbs.

**Clean Water Act (40 CFR 116.4):** Chromic acid - RQ 10 lbs. Mercuric sulfate - RQ = 10 lbs. (4.54 kgs.) Sulfuric acid - RQ 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:** Not applicable

**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 DSL Listed.

**EEC Inventory Status:** All ingredients used to make this product are listed on EINECS / ELINCS.

**Australian Inventory (AICS) Status:** All ingredients are listed.

**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.

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## 16. OTHER INFORMATION

**References:** 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. Lefevre, Marc J. First Aid Manual for Chemical Accidents, 2nd Ed. New York: Van Nostrand Reinhold Company, 1989. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. Technical Judgment. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Verschueren, Karel. Handbook of Environmental Data on Organic Chemicals. New York: Van Nostrand Reinhold Co., 1977.

**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. H340 May cause genetic defects. H350 May cause cancer. 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:** 04

**Month:** January

**Year:** 2013

**MSDS Prepared:** MSDS prepared by Product Compliance Department extension 3350

**CCOHS 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.

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**Legend:**

NA - Not Applicable  
ND - Not Determined  
NV - Not Available

w/w - weight/weight  
w/v - weight/volume  
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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