The following list contains the Material Safety Data Sheets you requested. Please scroll down to view the requested MSDS(s).

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<th>Product</th>
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<td>2408932</td>
<td>Hach Company</td>
<td>OSHA</td>
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<td>1</td>
</tr>
</tbody>
</table>

Total Enclosures: 4
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Dissolved Oxygen 1 Reagent
Catalog Number: 98199

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: M00029

Chemical Name: Sulfuric acid, manganese(2+) salt (1:1)
CAS No.: 7785-87-7
Chemical Formula: MnSO₄
Chemical Family: Inorganic Salt

Date of MSDS Preparation:
Day: 06
Month: August
Year: 2012

2. COMPOSITION / INFORMATION ON INGREDIENTS

Manganese Sulfate
CAS No.: 7785-87-7
TSCA CAS Number: 7785-87-7
Percent Range: 100.0
Percent Range Units: weight / weight
LD50: None reported
LC50: None reported
TLV: 0.2 mg/m³ (Mn)
PEL: Ceiling: 5 mg/m³ (Mn)

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: Pink powder
Odor: Not determined
HARMFUL IF INHALED MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:
Health: 1
Flammability: 0
Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:
Health: 1
Flammability: 0
Reactivity: 0

Symbol: Not applicable
Potential Health Effects:
**Eye Contact:** May cause irritation

**Skin Contact:** May cause irritation

**Skin Absorption:** No effects anticipated

**Target Organs:** Not applicable

**Ingestion:** Very large doses may cause: gastrointestinal irritation nausea

**Target Organs:** None reported

**Inhalation:** May cause: respiratory tract irritation pneumonitis

**Target Organs:** Lungs

**Medical Conditions Aggravated:** Pre-existing: Respiratory conditions Central nervous system diseases Liver conditions

**Chronic Effects:** Chronic inhalation of manganese (or Mn compounds) may cause psychiatric disorders characterized by irritability, difficulty walking, speech disturbances, and compulsive behavior. If the conditions persist, manganese poisoning may cause a mask-like facial expression, symptoms similar to Parkinson's disease, and cirrhosis of the liver.

**Cancer / Reproductive Toxicity Information:**

- O.S.H.A. Listed: No
- IARC Listed: No
- NTP Listed: No

**Additional Cancer / Reproductive Toxicity Information:** Contains: an experimental mutagen. an experimental teratogen.

**Toxicologically Synergistic Products:** None reported

---

### 4. FIRST AID

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

**Skin Contact (First Aid):** Wash skin with plenty of water. Call physician if irritation develops.

**Ingestion (First Aid):** Give 1-2 glasses of water. Induce vomiting using syrup of ipecac or by sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

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

---

### 5. FIRE FIGHTING MEASURES

**Flammable Properties:** 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 determined

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

**Fire / Explosion Hazards:** None reported

- **Static Discharge:** None reported
- **Mechanical Impact:** None reported

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

**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.

---

### 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)(y)) 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:** Stop spilled material from being released to the environment.

**Clean-up Technique:** Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

**Evacuation Procedure:** Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

**Special Instructions (for accidental release):** Product is regulated as a hazardous air pollutant in the U.S.

**304 EHS RQ (40 CFR 355):** Not applicable
7. HANDLING / STORAGE

*Handling:* Avoid contact with eyes skin Do not breathe dust. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

*Storage:* Store at 10 - 30°C. Keep away from: oxidizers powdered metals

*Flammability Class:* Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

*Engineering Controls:* Have an eyewash station nearby. Have a safety shower nearby. Maintain adequate ventilation to keep vapor level below TWA for chemicals in this product. Maintain general industrial hygiene practices when using this product.

*Personal Protective Equipment:*
  - **Eye Protection:** safety glasses with top and side shields
  - **Skin Protection:** disposable latex gloves
  - **Inhalation Protection:** adequate ventilation

*Precautionary Measures:* Avoid contact with: eyes skin Do not breathe: dust Wash thoroughly after handling. Use with adequate ventilation. Keep away from: oxidizers powdered metals

*TLV:* 0.2 mg/m³ (Mn)

*PEL:* Ceiling: 5 mg/m³ (Mn)

9. PHYSICAL / CHEMICAL PROPERTIES

*Appearance:* Pink powder

*Physical State:* Solid

*Molecular Weight:* 151.01

*Odor:* Not determined

*pH:* 3.7 (5% sol'n)

*Vapor Pressure:* Not applicable

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

*Boiling Point:* 850 ºC

*Melting Point:* > 400ºC (> 752ºF)

*Specific Gravity/ Relative Density (water = 1; air =1):* 3.25

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

*Volatile Organic Compounds Content:* Not applicable

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

*Solubility:*
  - **Water:** Soluble
  - **Acid:** Not determined
  - **Other:** Insoluble in alcohol

*Metal Corrosivity:*
  - **Steel:** Not determined
  - **Aluminum:** 0.002 in/yr (0.051 mm/yr)

10. STABILITY / REACTIVITY

*Chemical Stability:* Stable when stored under proper conditions.

*Conditions to Avoid:* Extreme temperatures Heating to decomposition.

*Reactivity / Incompatibility:* Incompatible with: oxidizers powdered metals

*Hazardous Decomposition:* Heating to decomposition releases toxic and/or corrosive fumes of: sulfur oxides manganese oxides

*Hazardous Polymerization:* Will not occur.

11. TOXICOLOGICAL INFORMATION

*Product Toxicological Data:*

*LD50:* None reported

*LC50:* None reported
Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: None reported
Mutation Data: Oral mouse sperm morphology @ 513 mg/kg/5D (Continuous); Hamster ovary cytogenetic analysis @ 180 mg/l; Hamster ovary sister chromatid exchange @ 5 mg/l; more data reported in RTECS.
Reproductive Effects Data: Oral mouse TDLo = 513 mg/kg (Paternal effects - spermatogenesis).
Ingredient Toxicological Data: --
Not applicable

12. ECOLOGICAL INFORMATION

Product Ecological Information: Mytilus edulis (mussel) 48 hr EC50 = 30 mg/L - abnormal embryo; Fucus spiralis 20 days 5 mg/L intermittent 42% decrease in growth rate.
Do not release into the environment.
Ingredient Ecological Information: --
Not applicable

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: Not applicable
Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the material to the drain. Flush system with plenty of water.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.
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.

14. TRANSPORT INFORMATION

D.O.T.:  
D.O.T. Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s. (Manganese sulfate)
DOT Hazard Class: 9
DOT Subsidiary Risk: NA
DOT ID Number: UN3077
DOT Packing Group: III
I.C.A.O.:  
I.C.A.O. Proper Shipping Name: Environmentally Hazardous Substance, Solid, nos (Manganese sulfate)
ICAO Hazard Class: 9
ICAO Subsidiary Risk: NA
ICAO ID Number: UN3077
ICAO Packing Group: III
I.M.O.:  
I.M.O. Proper Shipping Name: Environmentally Hazardous Substance, Solid, nos (Manganese sulfate)
I.M.O. Hazard Class: 9
I.M.O. Subsidiary Risk: NA
I.M.O. ID Number: UN3077
I.M.O. Packing Group: III
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. ALSO NOTE: If the National Competent Authority declares this product an environmental hazard by Special Provision 909 (IMDG) and Special Provision A97 (IATA) the classification may be UN3077 or UN3082.

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  
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.  
Manganese compounds  
302 (EHS) TPQ (40 CFR 355): Not applicable  
304 CERCLA RQ (40 CFR 302.4): Manganese Compounds 1 lb.  
304 EHS RQ (40 CFR 355): Not applicable  
Clean Water Act (40 CFR 116.4): Not applicable  
RCRA: Contains no RCRA regulated substances.  
C.P.S.C.: Not applicable  
State Regulations:  
California Prop. 65: No Prop. 65 listed chemicals are present in this product.  
Identification of Prop. 65 Ingredient(s): None  
California Perchlorate Rule CCR Title 22 Chap 33: Not applicable  
Trade Secret Registry: Not applicable  
National Inventories:  
U.S. Inventory Status: TSCA Listed: Yes  
TSCA CAS Number: 7785-87-7

16. OTHER INFORMATION

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

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.

HACH COMPANY ©2012
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Name:</th>
<th>Dissolved Oxygen 2 Reagent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog Number:</td>
<td>98299</td>
</tr>
</tbody>
</table>

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

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

MSDS Number: M00028

2. COMPOSITION / INFORMATION ON INGREDIENTS

**Potassium Iodide**
- **CAS No.**: 7681-11-0
- **TSCA CAS Number**: 7681-11-0
- **Percent Range**: 30.0 - 40.0
- **Percent Range Units**: weight / weight
- **LD50**: Oral Mouse LD50 = 1862 mg/kg
- **LC50**: None reported
- **TLV**: Not established
- **PEL**: Not established
- **Hazard**: Causes irritation.

**Lithium Hydroxide**
- **CAS No.**: 1310-65-2
- **TSCA CAS Number**: 1310-65-2
- **Percent Range**: 55.0 - 65.0
- **Percent Range Units**: weight / weight
- **LD50**: Oral rat LD50 = 225 mg/kg
- **LC50**: Inhalation rat LC50 = 980 mg/m³/4H
- **TLV**: 3mg/m³ Respirable Particles; 10 mg/m³ Inhalable particles
- **PEL**: 5 mg/m³ Respirable Fraction; 15 mg/m³ Total Dust
- **Hazard**: Toxic. Causes severe burns. Harmful if swallowed

**Sodium Azide**
- **CAS No.**: 26628-22-8
- **TSCA CAS Number**: 26628-22-8
3. HAZARDS IDENTIFICATION

Emergency Overview:

Appearance: White crystals

Odor: None

CAUSES SEVERE BURNS HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN

HMIS:

Health: 3
Flammability: 1
Reactivity: 1

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 3
Flammability: 1
Reactivity: 1

Symbol: Not applicable

Potential Health Effects:

Eye Contact: Causes severe burns

Skin Contact: Causes severe burns

Skin Absorption: Toxic. Effects similar to those of ingestion

Target Organs: Central nervous system

Ingestion: Toxic Causes: severe burns hypotension May cause iodism, which symptoms include skin rash, conjunctivitis, runny nose, sneezing, bronchitis, headache, fever and irritation of mucous membranes. May cause: abdominal pain dizziness nausea vomiting respiratory stimulation convulsions followed by respiratory depression central nervous system effects kidney damage liver damage spleen damage lung damage coma death

Target Organs: Central nervous system Bone marrow Kidneys Liver Spleen Lungs

Inhalation: Causes: severe burns May cause: coughing shortness of breath bronchitis headache dizziness weakness respiratory stimulation convulsions followed by respiratory depression death

Target Organs: None reported

Medical Conditions Aggravated: Sodium azide produces a larger blood pressure drop in persons with high blood pressure than in persons with normal blood pressure. Pre-existing: Eye conditions Skin conditions Respiratory conditions Kidney conditions Liver conditions

Chronic Effects: Lithium compounds have been implicated in development of aplastic anemia. Signs of lithium poisoning include dehydration, extreme weight loss, fine tremor of hands, nausea, vomiting and diarrhea, Chronic overexposure may cause headache central nervous system effects kidney damage liver damage

Cancer / Reproductive Toxicity Information:

This product does NOT contain any OSHA listed carcinogens.

This product does NOT contain any IARC listed chemicals.
This product does NOT contain any NTP listed chemicals.

Additional Cancer / Reproductive Toxicity Information: Contains: an experimental mutagen. an experimental teratogen.
Toxicologically Synergistic Products: None reported

4. FIRST AID

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.
Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Never give anything by mouth to an unconscious person. Call physician immediately.
Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

5. FIRE FIGHTING MEASURES

Flammable Properties: Does not burn, but may melt in a fire, releasing toxic fumes. 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 determined
Hazardous Combustion Products: None reported
Fire / Explosion Hazards: Contact with metals gives off hydrogen gas which is flammable. Closed containers may explode if heated.
  - Static Discharge: None reported.
  - Mechanical Impact: None reported
Extinguishing Media: Carbon dioxide Dry chemical. Water.
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.

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.
Containment Technique: Stop spilled material from being released to the environment.
Clean-up Technique: Avoid contact with spilled material. Sweep up material. Dispose of material in an E.P.A. approved hazardous waste facility. Decontaminate the area of the spill with a weak acid solution.
Evacuation Procedure: Evacuate general area (50 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.
Special Instructions (for accidental release): Mixture contains a component which is regulated as hazardous waste.
304 EHS RQ (40 CFR 355): Sodium Azide - RQ 1000 lbs.
D.O.T. Emergency Response Guide Number: 154

7. HANDLING / STORAGE
Handling: Avoid contact with eyes skin clothing Do not breathe dust. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Store in a cool, dry place. Keep away from: metals acids / acid fumes.

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

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: dust Wash thoroughly after handling. Keep away from: metals acids/acid fumes

TLV: Not established
PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: White crystals
Physical State: Solid
Molecular Weight: Not applicable
Odor: None
pH: 12.6 (5% sol’n)
Vapor Pressure: Not applicable
Vapor Density (air = 1): Not applicable
Boiling Point: Not applicable
Melting Point: 110°C (230°F)
Specific Gravity (water = 1): 1.94
Evaporation Rate (water = 1): Not applicable
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol / water): Not applicable

Solubility:
Water: Soluble
Acid: Not determined
Other: Not determined

Metal Corrosivity:
Steel: Not determined
Aluminum: 0.248 in/yr (6.30 mm/yr)

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Excess moisture Extreme temperatures
Reactivity / Incompatibility: May react violently in contact with: acids oxidizers
Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: iodine iodine compounds potassium oxide nitrogen oxides sodium oxides Contact with metals may release flammable hydrogen gas.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
**LD50:** Oral rat LD$_{50} = 350$ mg/kg  
**LC50:** None reported  
**Dermal Toxicity Data:** None reported  
**Skin and Eye Irritation Data:** None reported  
**Mutation Data:** Sodium Azide: DNA inhibition in human fibroblasts @ 50 mg/l; other data reported in RTECS.  
**Reproductive Effects Data:** None reported  
**Ingredient Toxicological Data:** Lithium Hydroxide: Oral rat LD$_{50} = 225$ mg/kg. Sodium Azide: Oral rat LD$_{50} = 27$ mg/kg; Dermal rabbit LD$_{50} = 20$ mg/kg.

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### 12. ECOLOGICAL INFORMATION

**Product Ecological Information:** --  
No ecological data available for this product.  
**Ingredient Ecological Information:** --  
No ecological data available for the ingredients of this product.

---

### 13. DISPOSAL CONSIDERATIONS

**EPA Waste ID Number:** D002  
**Special Instructions (Disposal):** Never put unreacted azides down the drain! 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.  
**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.

---

### 14. TRANSPORT INFORMATION

**D.O.T.:**  
**D.O.T. Proper Shipping Name:** Lithium Hydroxide Mixture  
**DOT Hazard Class:** 8  
**DOT Subsidiary Risk:** NA  
**DOT ID Number:** UN2680  
**DOT Packing Group:** II

**I.C.A.O.:**  
**I.C.A.O. Proper Shipping Name:** Lithium Hydroxide Mixture  
**ICAO Hazard Class:** 8  
**ICAO Subsidiary Risk:** NA  
**ICAO ID Number:** UN2680  
**ICAO Packing Group:** II

**I.M.O.:**  
**I.M.O. Proper Shipping Name:** Lithium Hydroxide Mixture  
**I.M.O. Hazard Class:** 8  
**I.M.O. Subsidiary Risk:** NA  
**I.M.O. ID Number:** UN2680  
**I.M.O. 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
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.
Sodium azide
302 (EHS) TPQ (40 CFR 355): Sodium Azide 500 lbs.
304 CERCLA RQ (40 CFR 302.4): Sodium azide 1000 lbs.
304 EHS RQ (40 CFR 355): Sodium Azide - RQ 1000 lbs.
Clean Water Act (40 CFR 116.4): Not applicable
RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.
C.P.S.C.: The label for this product bears the signal word "POISON" because the concentration of Lithium Hydroxide in the product is greater than/equal to 10%

State Regulations:
California Prop. 65: No Prop. 65 listed chemicals are present in this product.
Identification of Prop. 65 Ingredient(s): None
California Perchlorate Rule CCR Title 22 Chap 33: Not applicable
National Inventories:
U.S. Inventory Status: All ingredients in this product are listed on the TSCA 8(b) Inventory (40 CFR 710).
TSCA CAS Number: Not applicable

16. OTHER INFORMATION

Intended Use: Determination of dissolved oxygen
Revision Summary: Updates in Section(s) 2.

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.
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

   **Product Name:** Dissolved Oxygen 3 Powder Pillows  
   **Catalog Number:** 98799

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

   MSDS Number: M00007

   **Chemical Name:** Sulfamic Acid  
   **CAS No.:** 5329-14-6

   **Chemical Formula:** H₃NO₃S

   **Chemical Family:** Inorganic Acid

   **Hazard:** Causes eye burns.

   **Date of MSDS Preparation:**  
   Day: 25  
   Month: 06  
   Year: 2010

2. COMPOSITION / INFORMATION ON INGREDIENTS

   **Other component**  
   **CAS No.:** Not applicable  
   **TSCA CAS Number:** Not applicable  
   **Percent Range:** < 1.0  
   **Percent Range Units:** weight / weight  
   **LD50:** Not applicable  
   **LC50:** Not applicable  
   **TLV:** Not established  
   **PEL:** Not established

   **Sulfamic Acid**  
   **CAS No.:** 5329-14-6  
   **TSCA CAS Number:** 5329-14-6  
   **Percent Range:** > 99.0  
   **Percent Range Units:** weight / weight  
   **LD50:** Oral rat LD50 = 3160 mg/kg.  
   **LC50:** None reported  
   **TLV:** Not established  
   **PEL:** Not established  

   **Hazard:** Causes eye burns.

3. HAZARDS IDENTIFICATION

   **Emergency Overview:**  
   **Appearance:** White crystals
Odor: None

CAUSES EYE BURNS CAUSES SKIN AND RESPIRATORY TRACT IRRITATION

HMIS:
- Health: 2
- Flammability: 1
- Reactivity: 1

Protective Equipment: X - See protective equipment, Section 8.

NFPA:
- Health: 2
- Flammability: 1
- Reactivity: 1
- Symbol: Not applicable

Potential Health Effects:
- Eye Contact: Causes eye burns.
- Skin Contact: Causes severe irritation
- Skin Absorption: None reported
- Target Organs: None reported
- Ingestion: May cause: irritation of the mouth and esophagus gastrointestinal irritation
- Target Organs: None reported
- Inhalation: May cause: irritation of nose and throat
- Target Organs: None reported

Medical Conditions Aggravated:
- Pre-existing: Eye conditions Skin conditions Respiratory conditions

Cancer / Reproductive Toxicity Information:
- O.S.H.A. Listed: No
- IARC Listed: No
- NTP Listed: No
- Additional Cancer / Reproductive Toxicity Information: Not applicable

Toxicologically Synergistic Products: None reported

4. FIRST AID

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. Call physician immediately.

Ingestion (First Aid): Do not induce vomiting. Give 1-2 glasses of water. Call physician immediately. Never give anything by mouth to an unconscious person.

Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, irritating and highly 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

Hazardous Combustion Products: Toxic fumes of: ammonia nitrogen oxides sulfur oxides.

Fire / Explosion Hazards: May react violently with: chlorine / chlorine compounds metal nitrates metal nitrites nitric acid

Static Discharge: None reported.

Mechanical Impact: None reported

Extinguishing Media: Dry chemical. Water.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

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.

**Containment Technique:** Stop spilled material from being released to the environment. Cover spilled solid material with sand or other inert material.

**Clean-up Technique:** Scoop up spilled material into a large beaker and dissolve with water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Flush reacted material to the drain with a large excess of water. Decontaminate the area of the spill with a soap solution.

**Evacuation Procedure:** Evacuate local area (15 foot radius or as directed by your facility's emergency response plan) when: a pound or more of loose powder is spilled. If conditions warrant, increase the size of the evacuation.

**Special Instructions (for accidental release):** Product is regulated as RCRA hazardous waste in the U.S.

**D.O.T. Emergency Response Guide Number:** 154

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### 7. HANDLING / STORAGE

**Handling:** Avoid contact with eyes skin. Do not breathe dust. Maintain general industrial hygiene practices when using this product.

**Storage:** Store away from: oxidizers alkalies chlorine/chlorinated metals. Protect from: heat moisture

**Flammability Class:** Not applicable

---

### 8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

**Engineering Controls:** Have an eyewash station nearby. Maintain general industrial hygiene practices when using this product.

**Personal Protective Equipment:**
- **Eye Protection:** safety glasses with top and side shields
- **Skin Protection:** disposable latex gloves lab coat
- **Inhalation Protection:** adequate ventilation

**Precautionary Measures:** Avoid contact with: eyes skin. Do not breathe: dust. Wash thoroughly after handling. Keep away from: alkalies metals. Protect from: heat moisture

**TLV:** Not established

**PEL:** Not established

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### 9. PHYSICAL / CHEMICAL PROPERTIES

**Appearance:** White crystals

**Physical State:** Solid

**Molecular Weight:** 97.10

**Odor:** None

**pH:** 1% soln = 1.18

**Vapor Pressure:** Not applicable

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

**Boiling Point:** Not applicable

**Melting Point:** Product decomposes at 205 °C; 401 °F

**Specific Gravity/ Relative Density (water = 1; air =1):** 2.15

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

**Volatile Organic Compounds Content:** Not applicable

**Partition Coefficient (n-octanol / water):** None reported

**Solubility:**
- **Water:** 1:2 ratio @ 80 °C (176 °F)
- **Acid:** Soluble
- **Other:** Slightly soluble in alcohol, methanol.

**Metal Corrosivity:**
- **Steel:** 0.814 in/yr
- **Aluminum:** 0.212 in/yr

---

### 10. STABILITY / REACTIVITY

**Chemical Stability:** Stable when stored under proper conditions.
**Conditions to Avoid:** Heating to decomposition. Excess moisture

**Reactivity / Incompatibility:** May react violently in contact with: chlorates metal nitrates metal nitrites nitric acid

Incompatible with: alkalies oxidizers

**Hazardous Decomposition:** Heating to decomposition releases toxic and/or corrosive fumes of: ammonia nitrogen oxides sulfur oxides

**Hazardous Polymerization:** Will not occur.

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**11. TOXICOLOGICAL INFORMATION**

**Product Toxicological Data:**
- LD50: Oral rat LD50 = 3160 mg/kg.
- LC50: None reported
- Dermal Toxicity Data: None reported
- Skin and Eye Irritation Data: Skin Human 4%/5 days intermittent MILD, Skin rabbit 500 mg/24H SEVERE, Eye rabbit 20mg MODERATE, Eye rabbit 250µg/24H SEVERE.
- Mutation Data: None reported
- Reproductive Effects Data: None reported

**Ingredient Toxicological Data:**
- Not applicable

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**12. ECOLOGICAL INFORMATION**

**Product Ecological Information:**
- No ecological data available for this product.

**Ingredient Ecological Information:**
- Not applicable

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**13. DISPOSAL CONSIDERATIONS**

**EPA Waste ID Number:** None

**Special Instructions (Disposal):** Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an alkali, such as soda ash or sodium bicarbonate. Open cold water tap completely, slowly pour the reacted material to the drain.

**Empty Containers:** Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

**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.

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**14. TRANSPORT INFORMATION**

**D.O.T.:**
- **D.O.T. Proper Shipping Name:** Sulphamic Acid
- **DOT Hazard Class:** 8
- **DOT Subsidiary Risk:** NA
- **DOT ID Number:** UN2967
- **DOT Packing Group:** III

**I.C.A.O.:**
- **I.C.A.O. Proper Shipping Name:** Sulphamic Acid
- **ICAO Hazard Class:** 8
- **ICAO Subsidiary Risk:** NA
- **ICAO ID Number:** UN2967
- **ICAO Packing Group:** III

**I.M.O.:**
- **I.M.O. Proper Shipping Name:** Sulphamic Acid
- **I.M.O. Hazard Class:** 8
- **I.M.O. Subsidiary Risk:** NA
- **I.M.O. ID Number:** UN2967
- **I.M.O. Packing Group:** III
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

S.A.R.A. Title III Section 313 (40 CFR 372): This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.

302 (EHS) TPQ (40 CFR 355): Not applicable
304 CERCLA RQ (40 CFR 302.4): Not applicable
304 EHS RQ (40 CFR 355): Not applicable

Clean Water Act (40 CFR 116.4): Not applicable

RCRA: Contains no RCRA regulated substances.

C.P.S.C.: Not applicable

State Regulations:

California Prop. 65: No Prop. 65 listed chemicals are present in this product.

Identification of Prop. 65 Ingredient(s): Not applicable

California Perchlorate Rule CCR Title 22 Chap 33:

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: TSCA Listed: Yes

TSCA CAS Number: 5329-14-6

16. OTHER INFORMATION

Intended Use: Laboratory Use


Revision Summary: Updates in Section(s) 14,

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.

HACH COMPANY ©2010
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Sodium Thiosulfate Standard Solution, Stabilized, 0.0109 N

**Catalog Number:** 2408932

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

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

**MSDS Number:** M00371

**Chemical Name:** Not applicable

**CAS No.:** Not applicable

**Chemical Formula:** Not applicable

**Chemical Family:** Not applicable

**Hazard:** May cause irritation.

**Date of MSDS Preparation:**
Day: 31
Month: March
Year: 2012

2. COMPOSITION / INFORMATION ON INGREDIENTS

**Propylene Glycol**

CAS No.: 57-55-6

TSCA CAS Number: 57-55-6

Percent Range: 20.0 - 30.0

Percent Range Units: volume / volume

LD$_{50}$: Oral rat LD$_{50}$ = 20 g/kg

LC$_{50}$: None reported

TLV: Not established

PEL: Not established

**Hazard:** No effects anticipated.

**Demineralized Water**

CAS No.: 7732-18-5

TSCA CAS Number: 7732-18-5

Percent Range: 70.0 - 80.0

Percent Range Units: volume / volume

LD$_{50}$: None reported

LC$_{50}$: None reported

TLV: Not established

PEL: Not established

**Hazard:** No effects anticipated.

**Sodium Thiosulfate**

CAS No.: 7772-98-7

TSCA CAS Number: 7772-98-7

Percent Range: < 1.0

Percent Range Units: weight / volume

LD$_{50}$: Oral rat LD$_{50}$ > 5 000 mg/kg.

LC$_{50}$: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

Sodium Sulfate
CAS No.: 7757-82-6
TSCA CAS Number: 7757-82-6
Percent Range: 1.0 - 5.0
Percent Range Units: weight / volume
LD50: Oral mouse LD50 = 5989 mg/kg
LC50: None reported
TLV: Not established
PEL: Not established
Hazard: May cause irritation.

3. HAZARDS IDENTIFICATION

Emergency Overview:
Appearance: Clear, colorless liquid
Odor: Sweet
MAY CAUSE EYE AND SKIN IRRITATION

HMIS:
Health: 1
Flammability: 0
Reactivity: 0
Protective Equipment: X - See protective equipment, Section 8.

NFPA:
Health: 1
Flammability: 0
Reactivity: 0
Symbol: Not applicable

Potential Health Effects:
Eye Contact: May cause irritation
Skin Contact: May cause irritation
Skin Absorption: No effects anticipated
Target Organs: Not applicable
Ingestion: Very large doses may cause: central nervous system depression kidney damage rapid pulse and respirations
Target Organs: None reported
Inhalation: No effects anticipated
Target Organs: Not applicable
Medical Conditions Aggravated: None reported
Chronic Effects: None reported
Cancer / Reproductive Toxicity Information:
This product does NOT contain any OSHA listed carcinogens.
This product does NOT contain any IARC listed chemicals.
This product does NOT contain any NTP listed chemicals.
Additional Cancer / Reproductive Toxicity Information: None reported
Toxicologically Synergistic Products: None reported

4. FIRST AID

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.
Skin Contact (First Aid): Wash skin with soap and plenty of water. Call physician if irritation develops.
Ingestion (First Aid): Give large quantities of water. Call physician immediately.
Inhalation: Remove to fresh air.

5. FIRE FIGHTING MEASURES

Flammable Properties: During a fire, this product decomposes to form toxic gases.
Flash Point: > 100°C (212°F)
Method: Open cup
Flammability Limits:
  Lower Explosion Limits: Not determined
  Upper Explosion Limits: Not determined
Autoignition Temperature: Not determined
Hazardous Combustion Products: Toxic fumes of: sodium oxides, carbon monoxide, carbon dioxide.
Fire / Explosion Hazards: None reported
  Static Discharge: None reported.
  Mechanical Impact: None reported
Extinguishing Media: Use media appropriate to surrounding fire conditions
Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

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: Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment.
  Clean-up Technique: Absorb spilled liquid with non-reactive sorbent material. Sweep up material. Place material in a plastic bag. Mark bag 'Non-hazardous trash', and dispose of as normal refuse. Decontaminate the area of the spill with a soap solution.
  Evacuation Procedure: Evacuate as needed to perform spill clean-up. If conditions warrant, increase the size of the evacuation.
  Special Instructions (for accidental release): Not applicable
  304 EHS RQ (40 CFR 355): Not applicable
  D.O.T. Emergency Response Guide Number: None

7. HANDLING / STORAGE

Handling: Avoid contact with eyes skin. Do not breathe mist or vapors. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.
  Storage: Protect from: oxidizers
  Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

Engineering Controls: Maintain general industrial hygiene practices when using this product.
Personal Protective Equipment:
  Eye Protection: safety glasses with top and side shields
  Skin Protection: disposable latex gloves lab coat
  Inhalation Protection: adequate ventilation
  Precautionary Measures: Avoid contact with: eyes skin. Do not breathe: mist/vapor. Wash thoroughly after handling.
  TLV: Not established
  PEL: Not established

9. PHYSICAL / CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid
Physical State: Liquid
Molecular Weight: Not applicable
Odor: Sweet
pH: 9.9
Vapor Pressure: Not determined
Vapor Density (air = 1): Not determined
Boiling Point: 99°C (210°F)
Melting Point: -5°C (23°F)
Specific Gravity/Relative Density (water = 1; air = 1): 1.05
Evaporation Rate (water = 1): 0.91
Volatile Organic Compounds Content: Not applicable
Partition Coefficient (n-octanol/water): Not applicable
Solubility:
Water: Soluble
Acid: Soluble
Other: Not determined
Metal Corrosivity:
Steel: 0.006 in/yr
Aluminum: 0.003 in/yr

10. STABILITY / REACTIVITY

Chemical Stability: Stable when stored under proper conditions.
Conditions to Avoid: Heat, Evaporation
Reactivity / Incompatibility: Incompatible with: oxidizers
Hazardous Decomposition: Toxic fumes of: sodium oxides, carbon monoxide, carbon dioxide
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Product Toxicological Data:
LD50: None reported
LC50: None reported
Dermal Toxicity Data: None reported
Skin and Eye Irritation Data: None reported
Mutation Data: None reported
Reproductive Effects Data: None reported
Ingredient Toxicological Data: Propylene Glycol: Oral rat LD50 = 20 g/kg, Sodium Sulfate: Oral mouse LD50 = 5989 mg/kg, Sodium Thiourea: Oral rat LD50 > 8 g/kg

12. ECOLOGICAL INFORMATION

Product Ecological Information: --
No ecological data available for this product. Mobility in soil: No data available
Ingredient Ecological Information: --
No ecological data available for the ingredients of this product.

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: None
Special Instructions (Disposal): Dilute to 3 to 5 times the volume with cold water. Adjust to a pH between 6 and 9 with an acid, such as sulfuric or citric. Open cold water tap completely, slowly pour the reacted material to the drain. Allow cold water to run for 5 minutes to completely flush the system.
Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.
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.

14. TRANSPORT INFORMATION

D.O.T.:
D.O.T. Proper Shipping Name: Not Currently Regulated
--
DOT Hazard Class: NA
DOT Subsidiary Risk: NA
DOT ID Number: NA
DOT Packing Group: NA
I.C.A.O.:
I.C.A.O. **Proper Shipping Name**: Not Currently Regulated

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**ICAO Hazard Class**: NA  
**ICAO Subsidiary Risk**: NA  
**ICAO ID Number**: NA  
**ICAO Packing Group**: NA

**I.M.O.**:  
**I.M.O. Proper Shipping Name**: Not Currently Regulated  
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**I.M.O. Hazard Class**: NA  
**I.M.O. Subsidiary Risk**: NA  
**I.M.O. ID Number**: NA  
**I.M.O. Packing Group**: NA

**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**:

**OSHA**: 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  
  - **S.A.R.A. Title III Section 313 (40 CFR 372)**: This product does NOT contain any chemical subject to the reporting requirements of Section 313 of Title III of SARA.  
  ---
  - **302 (EHS) TPQ (40 CFR 355)**: Not applicable  
  - **304 CERCLA RQ (40 CFR 302.4)**: Not applicable  
  - **304 EHS RQ (40 CFR 355)**: Not applicable  
  - **Clean Water Act (40 CFR 116.4)**: Not applicable  
  - **RCRA**: Contains no RCRA regulated substances.

**C.P.S.C.**: Not applicable

**State Regulations**:

- **California Prop. 65**: No Prop. 65 listed chemicals are present in this product.  
- **Identification of Prop. 65 Ingredient(s)**: None  
- **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).  
- **TSCA CAS Number**: Not applicable

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### 16. OTHER INFORMATION

**Intended Use**: Laboratory Reagent Titrant solution


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

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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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