

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

MSDS No: M00047

# SAFETY DATA SHEET

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** DithiVer ® Metals Reagent  
**Catalog Number:** 1261699

HACH LANGE GmbH  
Willstätterstrasse 11  
40549 Düsseldorf, Germany  
+49-(0)211-52880

Emergency Telephone Numbers:  
(Poison Information Center Main)  
(+49 (0) 6131 19240) 24 HR

**SDS Number:** M00047

**Chemical Name:** Not applicable

**Chemical Formula:** Not applicable

**Chemical Family:** Not applicable

**Use of the substance/preparation:** Indicator of heavy metals

**CAS No.:** Not applicable

**Hazard:** May cause irritation. May cause allergic reaction.

**Date of MSDS Preparation:**

**Day:** 12

**Month:** 01

**Year:** 2006

**Additional Emergency Response Numbers:** Austria: +49 (0)6131 19240, Belgium: +32-(0)70-245245, France: +33 (0)1-40370404, Italy: +39-0266101029, Netherlands: +31 -(0)30-2748888, Switzerland: +41-(0)1-2515151

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

### Other components, each

**EEC Number:** Not applicable

**CAS No.:** Not applicable

**Percent Range:** < 1,0

**Percent Range Units:** weight / weight

**Ingredient EEC Symbol:** Not applicable

**Ingredient R phrase(s) (R phrase details given in Heading 16):** Not applicable

**TLV:** Not established

**PEL:** Not established

**EU Occupational Exposure Limits:** Not established

### Sodium Metabisulfite

**EEC Number:** 2316730

**CAS No.:** 7684574

**Percent Range:** > 99,0

**Percent Range Units:** weight / weight

**Ingredient EEC Symbol:** Xn - HARMFUL

**Ingredient R phrase(s) (R phrase details given in Heading 16):** R 22 R 31 R 36/37/38

**TLV:** 5 mg/m<sup>3</sup> (ACGIH - TWA)

**PEL:** Not established

**EU Occupational Exposure Limits:** 3 mg/m<sup>3</sup>, Inhalable dust

## 3. HAZARDS IDENTIFICATION

**Emergency Overview:**

**Appearance:** Gray powder

**Odor:** Sulfur-like

**EU Symbols:** Xn - HARMFUL

**R PHRASES:** R 22: Harmful if swallowed. R 31: Contact with acids liberates toxic gas. R 36/37/38: Irritating to eyes, respiratory system and skin.

**Protective Equipment:**

**Potential Health Effects:**

**Eye Contact (EC):** Causes irritation

**Skin Contact (EC):** Causes irritation

**Skin Absorption (EC):** No effects anticipated

**Target Organs (SA E):** Not applicable

**Ingestion (EC):** May cause: allergic respiratory reaction gastrointestinal tract irritation circulatory disturbances central nervous system depression Very large doses may cause: colic diarrhea death Harmful

**Target Organs (Ing E):** None Reported

**Inhalation:** Causes: respiratory tract irritation May cause: allergic respiratory reaction difficult breathing sweating rapid pulse and respirations blood pressure changes coughing flushing hives

**Target Organs (Inh E):** None Reported

**Medical Conditions Aggravated:** Sulfites are strong sensitizers. Inhalation and ingestion may cause allergic respiratory reactions in asthmatics. Persons with respiratory conditions should take special care when working with products that contain sulfites.

**Chronic Effects:** Chronic overexposure may cause allergic respiratory reactions

**Cancer / Reproductive Toxicity Information:**

An ingredient of this mixture is: IARC Group 3: Non-classifiable  
Metabisulfites

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

**Toxicologically Synergistic Products:** None reported

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## 4. FIRST AID MEASURES

**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):** 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. Give artificial respiration if necessary. Call physician.

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## 5. FIRE FIGHTING MEASURES

**Flammable Properties:** During a fire, corrosive and toxic gases may be generated by thermal decomposition.

**Hazardous Combustion Products:** Toxic fumes of: sodium monoxide sulfur oxides.

**Fire / Explosion Hazards:** May react violently with: strong acids strong oxidizers

**Static Discharge:** None reported.

**Mechanical Impact:** None reported

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

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

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

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## 6. ACCIDENTAL RELEASE MEASURES

**Spill Response Notice:**

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**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.

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## 7. HANDLING AND STORAGE

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

**Storage:** Protect from: moisture heat light Keep away from: oxidizers acids

**Special Packaging Instructions:** Not applicable

**Use of the substance/preparation:** Indicator of heavy metals

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## 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 / Hand Protection:** disposable latex gloves lab coat

**Inhalation Protection:** adequate ventilation

**Precautionary Measures:** Avoid contact with: eyes skin clothing Do not breathe: dust Wash thoroughly after handling.

Protect from: heat moisture light

**TLV:** Not established

**PEL:** Not established

**EU Occupational Exposure Limits:** 3 mg/m<sup>3</sup>, Inhalable dust

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## 9. PHYSICAL / CHEMICAL PROPERTIES

**Appearance:** Gray powder

**Physical State:** Solid

**Odor:** Sulfur-like

**pH:** 5% solution = 4,2

**Vapor Pressure:** Not applicable

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

**Boiling Point:** Not applicable

**Melting Point:** 10°C; 338°F

**Flash Point:** Not applicable

**Method:** Not applicable

**Autoignition Temperature:** Not applicable

**Flammability Limits:**

**Lower Explosion Limits:** Not applicable

**Upper Explosion Limits:** Not applicable

**Specific Gravity (water = 1):** 2,32

**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:** 0,004 in/yr

**Aluminum:** 0,019 in/yr

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## 10. STABILITY / REACTIVITY

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

**Conditions to Avoid:** Exposure to light. Extreme temperatures Excess moisture

**Reactivity / Incompatibility:** Incompatible with: acids oxidizers

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

**Hazardous Polymerization:** Will not occur.

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## 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:** Sodium metabisulfite: Cytogenic analysis hamster ovary 180 µg/l; Sister chromatid exchange on hamster ovary at 200 µg/l  
**Reproductive Effects Data:** Sodium metabisulfite: Oral rat TDLo = 20 g/kg effects on newborn - stillbirth; oral rat TDLo = 40 g/kg effects on newborn - weaning or lactation index

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**Ingredient Toxicological Data:** --  
No toxicological data available for the ingredients of this product.  
An ingredient of this mixture is: IARC Group 3: Non-classifiable  
Metabisulfites

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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.

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## 13. DISPOSAL CONSIDERATIONS

**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

**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 UN/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. UN Number:** NA  
**I.M.O. Packing Group:** NA

**A.D.R.:**  
**A.D.R. Proper Shipping Name:** Not Currently Regulated

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**A.D.R Hazard Class:** NA  
**A.D.R. Subsidiary Risk:** NA  
**A.D.R. UN-Number::** NA  
**A.D.R. Packing Group:** NA

**Additional Information:** This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316

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## 15. REGULATORY INFORMATION

**National Inventories:**  
**EEC Inventory Status:** All ingredients used to make this product are listed on EINECS / ELINCS.  
**EEC Number:** Not applicable

**EEC LABEL COPY:**

**EU Symbols:** Xn - HARMFUL

**R PHRASES:** R 22: Harmful if swallowed. R 31: Contact with acids liberates toxic gas. R 36/37/38: Irritating to eyes, respiratory system and skin.

**S PHRASES:** S 22: Do not breathe dust. S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 37/39: Wear suitable gloves and eye / face protection.

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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. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. In-house information. Vendor Information. Technical Judgment. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984.

**R PHRASES:** R 22: Harmful if swallowed. R 31: Contact with acids liberates toxic gas. R 36/37/38: Irritating to eyes, respiratory system and skin.

**Use of the substance/preparation:** Indicator of heavy metals

**Revision Summary:** Updates in Section(s) 14,

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

MSDS No: M00153

## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** Buffer Powder Pillows Citrate Type for Heavy Metals  
**Catalog Number:** 1420299

HACH LANGE GmbH  
Willstätterstrasse 11  
40549 Düsseldorf, Germany  
+49-(0)211-52880

Emergency Telephone Numbers:  
(Poison Information Center Main)  
(+49 (0) 6131 19240) 24 HR

**SDS Number:** M00153

**Chemical Name:** Not applicable

**Chemical Formula:** Not applicable

**Chemical Family:** Not applicable

**Use of the substance/preparation:** Buffer

**CAS No.:** Not applicable

**Hazard:** Causes irritation. Experimental carcinogen. May cause allergic reaction.

**Date of MSDS Preparation:**

**Day:** 23

**Month:** 10

**Year:** 2006

**Additional Emergency Response Numbers:** Austria: +49 (0)6131 19240, Belgium: +32-(0)70-245245, France: +33 (0)1-40370404, Italy: +39-0266101029, Netherlands: +31 -(0)30-2748888, Switzerland: +41-(0)1-2515151

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

#### Sodium Citrate

**EEC Number:** 2006753

**CAS No.:** 68042

**Percent Range:** 10,0 - 20,0

**Percent Range Units:** weight / weight

**Ingredient EEC Symbol:** Not applicable

**Ingredient R phrase(s) (R phrase details given in Heading 16):** Not applicable

**TLV:** Not established

**PEL:** Not established

**EU Occupational Exposure Limits:** 3 mg/m<sup>3</sup>, Inhalable dust

#### Hydrazine Sulfate

**EEC Number:** 2331104

**CAS No.:** 10034-93-2

**Percent Range:** 10,0 - 20,0

**Percent Range Units:** weight / weight

**Ingredient EEC Symbol:** T - TOXIC

**Ingredient R phrase(s) (R phrase details given in Heading 16):** R 20/21/22 R 43 R 45

**TLV:** 0,1 ppm (N<sub>2</sub>H<sub>4</sub>)

**PEL:** 0,1 ppm as N<sub>2</sub>H<sub>4</sub>

**EU Occupational Exposure Limits:** None found. 3 mg/m<sup>3</sup> Inhalable dust. For Hydrazine: 0,1 ppm (0,13 mg/m<sup>3</sup>).

#### Citric Acid

**EEC Number:** 2010691

**CAS No.:** 77929

**Percent Range:** 65,0 - 75,0

**Percent Range Units:** weight / weight  
**Ingredient EEC Symbol:** Xi - IRRITATING  
**Ingredient R phrase(s) (R phrase details given in Heading 16):** R 36  
**TLV:** Not established  
**PEL:** Not established  
**EU Occupational Exposure Limits:** 3 mg/m<sup>3</sup>, Inhalable dust

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### 3. HAZARDS IDENTIFICATION

**Emergency Overview:**

**Appearance:** White powder

**Odor:** Odorless

**EU Symbols:** T - TOXIC N - DANGEROUS FOR THE ENVIRONMENT

**R PHRASES:** R 45-20/21/22: May cause cancer. Also harmful by inhalation, in contact with skin and if swallowed. R 36: Irritating to eyes. R 43: May cause sensitization by skin contact. R 51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Protective Equipment:**

**Potential Health Effects:**

**Eye Contact (EC):** Causes irritation

**Skin Contact (EC):** May cause allergic reaction May cause irritation

**Skin Absorption (EC):** Harmful if absorbed through the skin

**Target Organs (SA E):** Central nervous system

**Ingestion (EC):** Harmful May cause: gastrointestinal disturbances central nervous system effects

**Target Organs (Ing E):** Central nervous system

**Inhalation:** Harmful May cause: respiratory tract irritation central nervous system effects

**Target Organs (Inh E):** Central nervous system

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

**Chronic Effects:** Citric acid chronic overexposure may cause effects due to the ability of citric acid to chelate metals, which could impair the body's ability to absorb calcium and iron. Chronic overexposure may cause cancer liver damage adverse effects to the blood lung damage kidney damage

**Cancer / Reproductive Toxicity Information:**

An ingredient of this mixture is: IARC Group 2B: Experimental Carcinogen  
Hydrazine Sulfate

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

**Toxicologically Synergistic Products:** None reported

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### 4. FIRST AID MEASURES

**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):** 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.

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### 5. FIRE FIGHTING MEASURES

**Flammable Properties:** Can burn in fire, releasing toxic vapors.

**Hazardous Combustion Products:** Toxic fumes of: nitrogen oxides. carbon monoxide, carbon dioxide. sulfur oxides. ammonia

**Fire / Explosion Hazards:** May react violently with: strong oxidizers metal nitrates

**Static Discharge:** None reported.

**Mechanical Impact:** None reported

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

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

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

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## 6. ACCIDENTAL RELEASE MEASURES

### **Spill Response Notice:**

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**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. Work in an approved fume hood. 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: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

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## 7. HANDLING AND STORAGE

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

**Storage:** Protect from: heat Keep away from: oxidizers

**Special Packaging Instructions:** Not applicable

**Use of the substance/preparation:** Buffer

---

## 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 / Hand Protection:** disposable latex gloves lab coat

**Inhalation Protection:** adequate ventilation

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

**TLV:** Not established

**PEL:** Not established

**EU Occupational Exposure Limits:** 3 mg/m<sup>3</sup>, Inhalable dust

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## 9. PHYSICAL / CHEMICAL PROPERTIES

**Appearance:** White powder

**Physical State:** Solid

**Odor:** Odorless

**pH:** 1% solution = 2,4

**Vapor Pressure:** Not applicable

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

**Boiling Point:** Not applicable

**Melting Point:** 153°C; 307°F

**Flash Point:** Not applicable

**Method:** Not applicable

**Autoignition Temperature:** Not available

### **Flammability Limits:**

**Lower Explosion Limits:** Not applicable

**Upper Explosion Limits:** Not applicable

**Specific Gravity (water = 1):** 1,74

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

**Volatile Organic Compounds Content:** Not applicable

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

### **Solubility:**

**Water:** Soluble

**Acid:** Soluble

**Other:** Not determined

### **Metal Corrosivity:**

**Steel:** 0,23 in/yr

**Aluminum:** 0,005 in/yr

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## 10. STABILITY / REACTIVITY

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

**Conditions to Avoid:** Heat Excess moisture

**Reactivity / Incompatibility:** Incompatible with: oxidizers metal nitrates metal nitrites

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

**Hazardous Polymerization:** Will not occur.

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## 11. TOXICOLOGICAL INFORMATION

**Product Toxicological Data:**

**LD50:** None reported

**LC50:** None reported

**Dermal Toxicity Data:** None reported

**Skin and Eye Irritation Data:** Citric Acid: Eye rabbit 750 µg/24H - SEVERE, Skin rabbit 500 mg/24H - MODERATE;

Hydrazine Sulfate: Eye rabbit 20 mg/24H - MODERATE

**Mutation Data:** Hydrazine Sulfate: Sister Chromatid Exchange - hamster - lung - 100 nmol/l; DNA inhibition - mouse - intraperitoneal - 180 mg/kg; More data available in RTECS

**Reproductive Effects Data:** None reported

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**Ingredient Toxicological Data:** Hydrazine Sulfate: Oral rat LD50 = 601 mg/kg; Citric Acid: Oral rat LD50 = 6730 mg/kg; Sodium Citrate: Oral rat LD50 > 8 g/kg

An ingredient of this mixture is: IARC Group 2B: Experimental Carcinogen  
Hydrazine Sulfate

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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.

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## 13. DISPOSAL CONSIDERATIONS

**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

**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 UN/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. UN Number:** NA

**I.M.O. Packing Group:** NA

**A.D.R.:**

**A.D.R. Proper Shipping Name:** Environmentally Hazardous Substance, Solid, nos

(Hydrazine sulfate)

**A.D.R Hazard Class:** 9

**A.D.R. Subsidiary Risk:** NA

**A.D.R. UN-Number::**

**A.D.R. Packing Group:** III

**Additional Information:** This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316 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.

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## 15. REGULATORY INFORMATION

### **National Inventories:**

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

**EEC Number:** Not applicable

### **EEC LABEL COPY:**

**EU Symbols:** T - TOXIC N - DANGEROUS FOR THE ENVIRONMENT

**R PHRASES:** R 45-20/21/22: May cause cancer. Also harmful by inhalation, in contact with skin and if swallowed. R 36: Irritating to eyes. R 43: May cause sensitization by skin contact. R 51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**S PHRASES:** S 53: Avoid exposure - obtain special instructions before use. S 24/25: Avoid contact with skin and eyes. S 35: This material and its container must be disposed of in a safe way. S 45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**Ingredients:** Hydrazine Sulfate; Citric Acid;

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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. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. 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. In-house information. Technical Judgment.

**R PHRASES:** R 45-20/21/22: May cause cancer. Also harmful by inhalation, in contact with skin and if swallowed. R 36: Irritating to eyes. R 43: May cause sensitization by skin contact. R 51/53: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Use of the substance/preparation:** Buffer

**Revision Summary:** Updates in Section(s) 14,

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

MSDS No: M00190

## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** Chloroform  
**Catalog Number:** 1445853

HACH LANGE GmbH  
Willstätterstrasse 11  
40549 Düsseldorf, Germany  
+49-(0)211-52880

Emergency Telephone Numbers:  
(Poison Information Center Main)  
(+49 (0) 6131 19240) 24 HR

**SDS Number:** M00190

**Chemical Name:** Methane, trichloro-

**Chemical Formula:** CHCl<sub>3</sub>

**Chemical Family:** Halogenated Hydrocarbons

**Use of the substance/preparation:** Laboratory Reagent

**CAS No.:** 67-66-3

**Hazard:** Toxic. Vapors harmful. Experimental carcinogen.

**Date of MSDS Preparation:**

**Day:** 12

**Month:** 01

**Year:** 2006

**Additional Emergency Response Numbers:** Austria: +49 (0)6131 19240, Belgium: +32-(0)70-245245, France: +33 (0)1-40370404, Italy: +39-0266101029, Netherlands: +31 -(0)30-2748888, Switzerland: +41-(0)1-2515151

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

#### Chloroform

**EEC Number:** 2006638

**CAS No.:** 67663

**Percent Range:** 100,0

**Percent Range Units:** volume / volume

**Ingredient EEC Symbol:** Xn - HARMFUL

**Ingredient R phrase(s) (R phrase details given in Heading 16):** R 48/20/22 R 22 R 38 R 40

**TLV:** TWA = 10 ppm (49 mg/m<sup>3</sup>)

**PEL:** C: 50 ppm (C: 240 mg/m<sup>3</sup>)

**EU Occupational Exposure Limits:** 2 ppm (10 mg/m<sup>3</sup>) Skin notation (Recommended)

### 3. HAZARDS IDENTIFICATION

#### **Emergency Overview:**

**Appearance:** Clear, colorless

**Odor:** Ether-like

**EU Symbols:** Xn - HARMFUL

**R PHRASES:** R 22: Harmful if swallowed. R 38: Irritating to skin. R 40: Limited evidence of a carcinogenic effect.

R 48/20/22: Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

#### **Protective Equipment:**

#### **Potential Health Effects:**

**Eye Contact (EC):** May cause irritation

**Skin Contact (EC):** Causes moderate irritation

**Skin Absorption (EC):** Causes central nervous system depression Causes kidney damage Causes liver damage

**Target Organs (SA E):** Central nervous system Kidneys Liver  
**Ingestion (EC):** Causes: central nervous system depression kidney damage liver damage  
**Target Organs (Ing E):** Central nervous system Kidneys Liver  
**Inhalation:** Causes: central nervous system depression kidney damage liver damage  
**Target Organs (Inh E):** Central nervous system Kidneys Liver  
**Medical Conditions Aggravated:** Pre-existing: Central nervous system diseases Kidney conditions Liver conditions  
**Chronic Effects:** None reported  
**Cancer / Reproductive Toxicity Information:**  
IARC Group 2B: Experimental Carcinogen  
Chloroform  
**Additional Cancer / Reproductive Toxicity Information:** Contains: a recognized teratogen. an experimental mutagen.  
**Toxicologically Synergistic Products:** Exposure to and/or consumption of alcohol may increase toxic effects of this product.

---

#### 4. FIRST AID MEASURES

**Eye Contact:** Immediately flush eyes with water for 15 minutes. Call physician.  
**Skin Contact (First Aid):** Wash skin with soap and plenty of water.  
**Ingestion (First Aid):** Do not induce vomiting. Call physician immediately.  
**Inhalation:** Remove to fresh air. Give artificial respiration if necessary. Call physician.

---

#### 5. FIRE FIGHTING MEASURES

**Flammable Properties:** Material will not burn. During a fire, corrosive and toxic gases may be generated by thermal decomposition.  
**Hazardous Combustion Products:** This material will not burn.  
**Fire / Explosion Hazards:** May react violently with: alkali metals aluminum / aluminum compounds strong bases  
**Static Discharge:** None reported.  
**Mechanical Impact:** None reported  
**Extinguishing Media:** Carbon dioxide Alcohol foam. Dry chemical.  
**Extinguishing Media NOT To Be Used:** Not applicable Not applicable Not applicable  
**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.

---

#### 6. ACCIDENTAL RELEASE MEASURES

**Spill Response Notice:**  
Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.  
**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:** Cover with an inert material, such as sand. Sweep up material. Incinerate material at an E.P.A. approved hazardous waste facility. Decontaminate the area of the spill with a soap solution.  
**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. If conditions warrant, increase the size of the evacuation.

---

#### 7. HANDLING AND STORAGE

**Handling:** Avoid contact with eyes skin clothing Do not breathe mist or vapors. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.  
**Storage:** Protect from: light air Store in a cool, well-ventilated place. Keep away from: alkali metals alkalies  
**Special Packaging Instructions:** Not applicable  
**Use of the substance/preparation:** Laboratory Reagent

---

#### 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 / Hand Protection:** lab coat pva (polyvinyl alcohol) gloves

**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. Keep away from: alkali metals alkalies

**TLV:** TWA = 10 ppm (49 mg/m<sup>3</sup>)

**PEL:** C: 50 ppm (C: 240 mg/m<sup>3</sup>)

**EU Occupational Exposure Limits:** 2 ppm (10 mg/m<sup>3</sup>) Skin notation (Recommended)

---

## 9. PHYSICAL / CHEMICAL PROPERTIES

**Appearance:** Clear, colorless

**Physical State:** Liquid

**Odor:** Ether-like

**pH:** Not determined.

**Vapor Pressure:** 159 mm Hg @ 20°C (68°F).

**Vapor Density (air = 1):** 4,1 (at boiling point of chloroform).

**Boiling Point:** 61°C (142°F).

**Melting Point:** -64°C (-83,2°F).

**Flash Point:** Not applicable

**Method:** Not applicable

**Autoignition Temperature:** Not applicable

**Flammability Limits:**

**Lower Explosion Limits:** Not applicable

**Upper Explosion Limits:** Not applicable

**Specific Gravity (water = 1):** 1,49 @ 20°C (68°F).

**Evaporation Rate (water = 1):** Not determined. The evaporation rate where: (ether=1) = 0,6; (butyl acetate=1) = 11,6.

**Volatile Organic Compounds Content:** 100%.

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

**Solubility:**

**Water:** 1ml in 200ml water @ 25°C (77°F).

**Acid:** Not determined.

**Other:** Alcohol, Benzene, Ether, Carbon Tetrachloride, Carbon Disulfide.

**Metal Corrosivity:**

**Steel:** Not determined.

**Aluminum:** Not determined.

---

## 10. STABILITY / REACTIVITY

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

**Conditions to Avoid:** Exposure to air. Exposure to light. Extreme temperatures Heating to decomposition.

**Reactivity / Incompatibility:** Incompatible with: alkali metals alkalies aluminum caustics coatings (such as paint, varnish, wax, lacquer, etc.) plastics rubber

**Hazardous Decomposition:** Heating to decomposition releases toxic and/or corrosive fumes of: phosgene chlorides carbon monoxide

**Hazardous Polymerization:** Will not occur.

---

## 11. TOXICOLOGICAL INFORMATION

**Product Toxicological Data:**

**LD50:** Oral rat LD<sub>50</sub> = 695 mg/kg; Oral mouse LD<sub>50</sub> = 36 mg/kg.

**LC50:** Inhalation rat LC<sub>50</sub> = 47702 mg/m<sup>3</sup>/4hrs.

**Dermal Toxicity Data:** Skin rabbit LD<sub>50</sub> = >20g/kg.

**Skin and Eye Irritation Data:** Skin rabbit (Standard Draize test) 500 mg/24hrs = MILD; Skin rabbit (Open Draize test) 10 mg/24hrs = MILD; Eye rabbit (Standard Draize test) 20 mg/24hrs = MODERATE.

**Mutation Data:** Sister chromatid exchange in human lymphocytes @ 10 mmol/l; Cytogenetic analysis of rat @ 597 mg/kg/5D (intermittent oral administration); DNA damage in mammalian lymphocytes @ 1 mmol/l; More data reported in RTECS.

**Reproductive Effects Data:** Oral rat TDLo (female) = 1260 mg/kg (Fetotoxicity; Musculoskeletal abnormalities); Inhalation rat TCLo (female) = 30 ppm/7H (Fertility effects; Fetotoxicity; Musculoskeletal abnormalities); Oral mouse TDLo (male) = 2177 mg/kg (Reduced weight gain in newborn; Biochemical and metabolic effects on newborn); More data reported in RTECS.

**Ingredient Toxicological Data:** --

Not applicable

IARC Group 2B: Experimental Carcinogen

Chloroform

---

## 12. ECOLOGICAL INFORMATION

**Product Ecological Information:** --

No ecological data available for this product.

**Ingredient Ecological Information:** --

Not applicable

---

## 13. DISPOSAL CONSIDERATIONS

**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

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

**I.C.A.O. Proper Shipping Name:** Chloroform

--

**ICAO Hazard Class:** 6,1

**ICAO Subsidiary Risk:** NA

**ICAO UN/ID Number:** UN1888

**ICAO Packing Group:** III

**I.M.O.:**

**I.M.O. Proper Shipping Name:** Chloroform

--

**I.M.O. Hazard Class:** 6,1

**I.M.O. Subsidiary Risk:** NA

**I.M.O. UN Number:** UN1888

**I.M.O. Packing Group:** III

**A.D.R.:**

**A.D.R. Proper Shipping Name:** Chloroform

--

**A.D.R. Hazard Class:** 6,1

**A.D.R. Subsidiary Risk:** NA

**A.D.R. UN-Number:** 1888

**A.D.R. Packing Group:** III

**Additional Information:** This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316

---

## 15. REGULATORY INFORMATION

**National Inventories:**

**EEC Inventory Status:** EINECS Listed: Yes

**EEC Number:** 2006638

**EEC LABEL COPY:**

**EU Symbols:** Xn - HARMFUL

**R PHRASES:** R 22: Harmful if swallowed. R 38: Irritating to skin. R 40: Limited evidence of a carcinogenic effect. R 48/20/22: Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

**S PHRASES:** S 36/37: Wear suitable protective clothing and gloves.

---

## 16. OTHER INFORMATION

**References:** Vendor Information. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Technical Judgment. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. Cincinnati: Department of Health and Human Services, 1981. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. 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. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Cassaret and Doull's Toxicology, 3rd Ed. New York: Macmillan Publishing Co., Inc., 1986. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). EU Occupational Exposure Limits On Line.

**R PHRASES:** R 22: Harmful if swallowed. R 38: Irritating to skin. R 40: Limited evidence of a carcinogenic effect. R 48/20/22: Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.

**Use of the substance/preparation:** Laboratory Reagent

**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.**

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

MSDS No: M00571

## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** Sodium Hydroxide Solution 50% (w/w)  
**Catalog Number:** 218049

HACH LANGE GmbH  
Willstätterstrasse 11  
40549 Düsseldorf, Germany  
+49-(0)211-52880

Emergency Telephone Numbers:  
(Poison Information Center Main)  
(+49 (0) 6131 19240) 24 HR

**SDS Number:** M00571  
**Chemical Name:** Not applicable  
**Chemical Formula:** Not applicable  
**Chemical Family:** Not applicable  
**Use of the substance/preparation:** Laboratory Reagent  
**CAS No.:** Not applicable  
**Hazard:** Causes burns.  
**Date of MSDS Preparation:**  
**Day:** 12  
**Month:** 01  
**Year:** 2006

**Additional Emergency Response Numbers:** Austria: +49 (0)6131 19240, Belgium: +32-(0)70-245245, France: +33 (0)1-40370404, Italy: +39-0266101029, Netherlands: +31 -(0)30-2748888, Switzerland: +41-(0)1-2515151

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

#### Sodium Hydroxide

**EEC Number:** 2151855  
**CAS No.:** 1310732  
**Percent Range:** 45,0 - 55,0  
**Percent Range Units:** weight / weight  
**Ingredient EEC Symbol:** C - CORROSIVE  
**Ingredient R phrase(s) (R phrase details given in Heading 16):** R 35  
**TLV:** 2 mg/m<sup>3</sup>  
**PEL:** 2 mg/m<sup>3</sup>  
**EU Occupational Exposure Limits:** 2 mg/m<sup>3</sup>

#### Demineralized Water

**EEC Number:** 2317912  
**CAS No.:** 7732185  
**Percent Range:** 45,0 - 55,0  
**Percent Range Units:** weight / weight  
**Ingredient EEC Symbol:** Not applicable  
**Ingredient R phrase(s) (R phrase details given in Heading 16):** Not applicable  
**TLV:** Not established  
**PEL:** Not established  
**EU Occupational Exposure Limits:** Not established

### 3. HAZARDS IDENTIFICATION

**Emergency Overview:**

**Appearance:** Clear, colorless liquid  
**Odor:** Pungent  
**EU Symbols:** C - CORROSIVE  
**R PHRASES:** R 35: Causes severe burns.

**Protective Equipment:**

**Potential Health Effects:**

**Eye Contact (EC):** Causes burns  
**Skin Contact (EC):** Causes burns  
**Skin Absorption (EC):** None Reported  
**Target Organs (SA E):** None Reported  
**Ingestion (EC):** Causes: burns Can cause: abdominal pain collapse vomiting death  
**Target Organs (Ing E):** None Reported  
**Inhalation:** Causes: burns May cause: chemical pneumonitis  
**Target Organs (Inh E):** None Reported  
**Medical Conditions Aggravated:** Pre-existing: Respiratory conditions Eye conditions Skin conditions  
**Chronic Effects:** Chronic overexposure may cause destruction of any tissue contacted  
**Cancer / Reproductive Toxicity Information:**  
This product does NOT contain any IARC listed chemicals.

**Additional Cancer / Reproductive Toxicity Information:** None reported  
**Toxicologically Synergistic Products:** None reported

---

#### 4. FIRST AID MEASURES

**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 large quantities of water. Call physician immediately. Never give anything by mouth to an unconscious person.  
**Inhalation:** Remove to fresh air. Give artificial respiration if necessary. Call physician.

---

#### 5. FIRE FIGHTING MEASURES

**Flammable Properties:** Not Flammable, but reacts with most metals to form flammable hydrogen gas.  
**Hazardous Combustion Products:** This material will not burn.  
**Fire / Explosion Hazards:** May react violently with: acids  
**Static Discharge:** None reported.  
**Mechanical Impact:** None reported  
**Extinguishing Media:** Use media appropriate to surrounding fire conditions  
**Extinguishing Media NOT To Be Used:** Not applicable  
**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 should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.  
**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:** Cover spilled material with a dry acid, such as citric or boric. Scoop up slurry into a large beaker. Dilute with a large excess of water. Adjust to a pH between 6 and 9. Use sulfuric or citric acid to lower pH. Use soda ash or sodium bicarbonate to increase pH. 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: any quantity is spilled. If conditions warrant, increase the size of the evacuation.

---

#### 7. HANDLING AND STORAGE

**Handling:** Avoid contact with eyes skin clothing Do not breathe mist or vapors. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product.

**Storage:** Keep container tightly closed when not in use. Store away from: acids halogenated hydrocarbons metals

**Special Packaging Instructions:** Not applicable

**Use of the substance/preparation:** Laboratory Reagent

---

## 8. EXPOSURE CONTROLS / PROTECTIVE EQUIPMENT

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

**Personal Protective Equipment:**

**Eye Protection:** chemical splash goggles

**Skin / Hand Protection:** lab coat disposable latex gloves

**Inhalation Protection:** laboratory fume hood and / or dust / mist mask

**Precautionary Measures:** Avoid contact with: eyes skin clothing Do not breathe: mist/vapor Wash thoroughly after handling. Keep away from: acids/acid fumes halogenated hydrocarbons

**TLV:** Not established

**PEL:** Not established

**EU Occupational Exposure Limits:** Not established

---

## 9. PHYSICAL / CHEMICAL PROPERTIES

**Appearance:** Clear, colorless liquid

**Physical State:** Liquid

**Odor:** Pungent

**pH:** 14

**Vapor Pressure:** 13mm Hg @ 60°C

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

**Boiling Point:** 145°C (293°F)

**Melting Point:** Not determined

**Flash Point:** Not applicable

**Method:** Not applicable

**Autoignition Temperature:** Not applicable

**Flammability Limits:**

**Lower Explosion Limits:** Not applicable

**Upper Explosion Limits:** Not applicable

**Specific Gravity (water = 1):** 1,530

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

**Volatile Organic Compounds Content:** Not applicable

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

**Solubility:**

**Water:** Soluble

**Acid:** Soluble

**Other:** Soluble in methanol and glycerol

**Metal Corrosivity:**

**Steel:** Corrosive

**Aluminum:** Corrosive

---

## 10. STABILITY / REACTIVITY

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

**Conditions to Avoid:** Extreme temperatures

**Reactivity / Incompatibility:** Incompatible with: acids halogenated organic compounds nitro compounds metals zinc tin aluminum

**Hazardous Decomposition:** None reported

**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:** Sodium hydroxide: Eye irritation rabbit: 50 µg/24H - SEVERE; 1 mg/24H - SEVERE; 100 mg rinse - SEVERE; Skin irritation rabbit: 500 mg/24H - SEVERE

**Mutation Data:** None reported

**Reproductive Effects Data:** None reported

--

**Ingredient Toxicological Data:** Sodium hydroxide: Oral rat LDLo = 500 mg/kg

This product does NOT contain any IARC listed chemicals.

---

## 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

**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

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

**I.C.A.O. Proper Shipping Name:** Sodium Hydroxide Solution

--

**ICAO Hazard Class:** 8

**ICAO Subsidiary Risk:** NA

**ICAO UN/ID Number:** UN1824

**ICAO Packing Group:** II

**I.M.O.:**

**I.M.O. Proper Shipping Name:** Sodium Hydroxide Solution

--

**I.M.O. Hazard Class:** 8

**I.M.O. Subsidiary Risk:** NA

**I.M.O. UN Number:** UN1824

**I.M.O. Packing Group:** II

**A.D.R.:**

**A.D.R. Proper Shipping Name:** Sodium Hydroxide Solution

--

**A.D.R Hazard Class:** 8

**A.D.R. Subsidiary Risk:** NA

**A.D.R. UN-Number::** 1824

**A.D.R. Packing Group:** II

**Additional Information:** This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316

---

## 15. REGULATORY INFORMATION

**National Inventories:**

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

**EEC Number:** Not applicable

**EEC LABEL COPY:**

**EU Symbols:** C - CORROSIVE

**R PHRASES:** R 35: Causes severe burns.

**S PHRASES:** S 26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 27: Take off immediately all contaminated clothing. S 37/39: Wear suitable gloves and eye / face protection.

---

## 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. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. Technical Judgment. 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. In-house information. Vendor Information. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 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.

**R PHRASES:** R 35: Causes severe burns.

**Use of the substance/preparation:** Laboratory Reagent

**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.**

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

MSDS No: M00264

# SAFETY DATA SHEET

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Name:** Potassium Cyanide  
**Catalog Number:** 76714

HACH LANGE GmbH  
Willstätterstrasse 11  
40549 Düsseldorf, Germany  
+49-(0)211-52880

Emergency Telephone Numbers:  
(Poison Information Center Main)  
(+49 (0) 6131 19240) 24 HR

**SDS Number:** M00264  
**Chemical Name:** Potassium Cyanide  
**Chemical Formula:** KCN  
**Chemical Family:** Cyanides  
**Use of the substance/preparation:** Laboratory reagent  
**CAS No.:** 151-508  
**Hazard:** Fast-acting poison.  
**Date of MSDS Preparation:**  
**Day:** 12  
**Month:** 01  
**Year:** 2006

**Additional Emergency Response Numbers:** Austria: +49 (0)6131 19240, Belgium: +32-(0)70-245245, France: +33 (0)1-40370404, Italy: +39-0266101029, Netherlands: +31 -(0)30-2748888, Switzerland: +41-(0)1-2515151

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

### Potassium Cyanide

**EEC Number:** 2057923  
**CAS No.:** 151-50-8  
**Percent Range:** 100,0  
**Percent Range Units:** weight / weight  
**Ingredient EEC Symbol:** T+ - VERY TOXIC N - Dangerous for the Environment  
**Ingredient R phrase(s) (R phrase details given in Heading 16):** R 26/27/28 R 32 R 50/53  
**TLV:** 5 mg/m<sup>3</sup> (skin)  
**PEL:** 5 mg/m<sup>3</sup> (skin)  
**EU Occupational Exposure Limits:** None found. Cyanides are on the Priority List for OELs.

## 3. HAZARDS IDENTIFICATION

### **Emergency Overview:**

**Appearance:** White powder

**Odor:** Bitter Almonds

**EU Symbols:** T+ - VERY TOXIC N - DANGEROUS FOR THE ENVIRONMENT

**R PHRASES:** R 26/27/28: Very toxic by inhalation, in contact with skin and if swallowed. R 32: Contact with acids liberates very toxic gas. R 50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Emergency response to cyanide exposure should be planned and practiced prior to work with cyanides. First responders should start treatment and get medical attention immediately. Antidote: break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Repeat 5 times at 15 second intervals. Transport to hospital immediately. Note to Physician: Have a cyanide first aid kit available. If patient has not responded to amyl nitrite, inject intravenously 10 ml of a 3% solution of sodium nitrite at a rate not greater than 2,5 - 5 ml/min. Follow directly with 50

ml of a 25 % solution of sodium thiosulfate at the same rate by the same route. Keep patient under observation. If signs of poisoning persist or reappear, repeat nitrite and thiosulfate injections 1 hour later in one-half the original doses.

**Protective Equipment:**

**Potential Health Effects:**

**Eye Contact (EC):** May cause irritation May cause: ataxia - loss of muscular coordination respiratory stimulation

**Skin Contact (EC):** No effects are anticipated

**Skin Absorption (EC):** Harmful if absorbed through the skin Effects similar to those of ingestion

**Target Organs (SA E):** Central nervous system

**Ingestion (EC):** Very Toxic May be rapidly fatal. Causes: cyanosis ( a reduction of the blood's ability to carry oxygen, giving a bluish discoloration) May cause: anxiety headache confusion irregular heartbeat coma death

**Target Organs (Ing E):** Brain Central nervous system

**Inhalation:** Effects similar to those of ingestion.

**Target Organs (Inh E):** Brain Central nervous system

**Medical Conditions Aggravated:** Pre-existing: Skin conditions

**Chronic Effects:** Chronic overexposure may cause central nervous system effects

**Cancer / Reproductive Toxicity Information:**

IARC Listed: No

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

**Toxicologically Synergistic Products:** None reported

---

## 4. FIRST AID MEASURES

**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):** Break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Repeat every five minutes. Administer artificial respiration with 100% oxygen. Transport to hospital immediately.

**Inhalation:** Break an amyl nitrite pearl in cloth and hold lightly under nose for 15 seconds. Repeat 5 times at 15 second intervals. Transport to hospital immediately.

---

## 5. FIRE FIGHTING MEASURES

**Flammable Properties:** Reacts with water or any acid to form flammable hydrogen cyanide gas.

**Hazardous Combustion Products:** Toxic fumes of: cyanide compounds nitrogen oxides.

**Fire / Explosion Hazards:** Not combustible. Reaction with water or any acid releases toxic and flammable hydrogen cyanide gas.

**Static Discharge:** None reported.

**Mechanical Impact:** None reported

**Extinguishing Media:** Alkali dry chemical. Do NOT use carbon dioxide. Do NOT use water.

**Extinguishing Media NOT To Be Used:** Not applicable Do NOT use carbon dioxide. Do NOT use water.

**Fire Fighting Instruction:** Evacuate area and fight fire from a safe distance. As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear.

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## 6. ACCIDENTAL RELEASE MEASURES

**Spill Response Notice:**

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

**Containment Technique:** Releases of this material may contaminate the environment. Stop spilled material from being released to the environment.

**Clean-up Technique:** Cover spilled material with an alkali, such as soda ash or sodium bicarbonate. Carefully mist spill with bleach until saturated. Scoop up slurry into a large beaker. Oxidize spilled material with a 50% excess of bleach containing at least 5% sodium hypochlorite. Allow to react for 24 hours in a fume hood. Flush reacted material to the drain with a large excess of water. Decontaminate area with bleach solution.

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

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## 7. HANDLING AND STORAGE

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

**Storage:** Store away from: acids / acid fumes. oxidizers

**Special Packaging Instructions:** Not applicable

**Use of the substance/preparation:** Laboratory reagent

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## 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.

**Personal Protective Equipment:**

**Eye Protection:** safety glasses with top and side shields

**Skin / Hand Protection:** lab coat disposable latex gloves

**Inhalation Protection:** laboratory fume hood

**Precautionary Measures:** Avoid contact with: eyes skin clothing Do not breathe: dust Wash thoroughly after handling. Keep away from: acids/acid fumes

**TLV:** 5 mg/m<sup>3</sup> (skin)

**PEL:** 5 mg/m<sup>3</sup> (skin)

**EU Occupational Exposure Limits:** None found. Cyanides are on the Priority List for OELs.

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## 9. PHYSICAL / CHEMICAL PROPERTIES

**Appearance:** White powder

**Physical State:** Solid

**Odor:** Bitter Almonds

**pH:** 11,0 (0,1% solution)

**Vapor Pressure:** Not applicable

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

**Boiling Point:** Not applicable

**Melting Point:** 634° C; 1173° F

**Flash Point:** Not applicable

**Method:** Not applicable

**Autoignition Temperature:** Not applicable

**Flammability Limits:**

**Lower Explosion Limits:** Not applicable

**Upper Explosion Limits:** Not applicable

**Specific Gravity (water = 1):** 1,52

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

**Volatile Organic Compounds Content:** Not applicable

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

**Solubility:**

**Water:** Soluble

**Acid:** Soluble; Generates toxic hydrogen cyanide gas

**Other:** Soluble in glycerol, methanol

**Metal Corrosivity:**

**Steel:** Not determined

**Aluminum:** Not determined

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## 10. STABILITY / REACTIVITY

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

**Conditions to Avoid:** Excess moisture Heating to decomposition.

**Reactivity / Incompatibility:** Reacts with water or any acid to form toxic and flammable hydrogen cyanide gas.

Incompatible with: oxidizers metallic salts alkaloidal salts

**Hazardous Decomposition:** Contact with acids/acid fumes releases toxic cyanide gas. Heating to decomposition releases: cyanide nitrogen oxides

**Hazardous Polymerization:** Will not occur.

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## 11. TOXICOLOGICAL INFORMATION

**Product Toxicological Data:**

**LD50:** Oral human LD Lo = 2,857 mg/kg; Oral rat LD<sub>50</sub> = 5 mg/kg; Ocular rabbit LD<sub>50</sub> = 7.87 mg/kg.

**LC50:** None reported

**Dermal Toxicity Data:** None reported

**Skin and Eye Irritation Data:** None reported

**Mutation Data:** DNA Inhibition in mouse lymphocytes @ 1 mmol/l; Cytogenic analysis in mouse mammary gland @ 1 mmol/l/48hr.

**Reproductive Effects Data:** Oral mammal - domestic animal TD Lo = 1767 mg/kg: effects on newborn.

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**Ingredient Toxicological Data: --**

Not applicable

IARC Listed: No

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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

**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

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

**I.C.A.O. Proper Shipping Name:** Potassium Cyanide, Solid

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**ICAO Hazard Class:** 6,1

**ICAO Subsidiary Risk:** NA

**ICAO UN/ID Number:** UN1680

**ICAO Packing Group:** I

**I.M.O.:**

**I.M.O. Proper Shipping Name:** Potassium Cyanide, Solid

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**I.M.O. Hazard Class:** 6,1

**I.M.O. Subsidiary Risk:** NA

**I.M.O. UN Number:** UN1680

**I.M.O. Packing Group:** I

**A.D.R.:**

**A.D.R. Proper Shipping Name:** Potassium Cyanide, Solid

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**A.D.R. Hazard Class:** 6,1

**A.D.R. Subsidiary Risk:** NA

**A.D.R. UN-Number:** 1680

**A.D.R. Packing Group:** I

**Additional Information:** This product may be shipped as part of a chemical kit composed of various compatible dangerous goods for analytical or testing purposes. This kit would have the following classification: Proper Shipping Name: Chemical Kit Hazard Class: 9 UN Number 3316

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## 15. REGULATORY INFORMATION

**National Inventories:**

*EEC Inventory Status:* EINECS Listed: Yes

*EEC Number:* 2057923

**EEC LABEL COPY:**

**EU Symbols:** T+ - VERY TOXIC N - DANGEROUS FOR THE ENVIRONMENT

**R PHRASES:** R 26/27/28: Very toxic by inhalation, in contact with skin and if swallowed. R 32: Contact with acids liberates very toxic gas. R 50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**S PHRASES:** S 7: Keep container tightly closed. S 28a: After contact with skin, wash immediately with plenty of water. S 29: Do not empty into drains. S 45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S 60: This material and / or its container must be disposed of as hazardous waste. S 61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

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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. Gosselin, R. E. et al. Clinical Toxicology of Commercial Products, 5th Ed. Baltimore: The Williams and Wilkins Co., 1984. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. In-house information. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. 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. Vendor Information. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989.

**R PHRASES:** R 26/27/28: Very toxic by inhalation, in contact with skin and if swallowed. R 32: Contact with acids liberates very toxic gas. R 50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**Use of the substance/preparation:** Laboratory reagent

**Revision Summary:** Updates in Section(s) 14,

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### 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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