MATERIAL SAFETY DATA SHEET
Edwal One-Step Tank, Tray, & Rack Cleaner

SECTION I PRODUCT IDENTIFICATION

Trade Name: **Edwal One-Step Tank, Tray, & Rack Cleaner** **Date: 01/23/2006**
Product Code(s): **ED-OS-32; ED-OS-324**
Manufacturer: Brandess/Kalt/Aetna
701 Corporate Woods Pkwy
Vernon Hills, Il 60061
847-821-4237
Emergency Phone # **Chemtrec 800-424-9300**
Product Form: Liquid Solution
Synonyms: None

SECTION II HAZARDOUS INGREDIENTS

Ingredients	CAS #	%
Thiocarbamide	62-56-6	< 6%

SECTION III PHYSICAL DATA

Boiling Point (°F)	212°F	**Appearance and Odor**	Water white to light yellow liquid, slight pine scent
Vapor Pressure (MM hg)	NE	**Specific Gravity**	1.090
Vapor Density (Air=1)	NE	**pH**	**3.3**
Solubility In Water	Complete	**Evaporation Rate (Ether =1)**	<1

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point – Non Flammable **Flammable Limits** **LEL** – NA **UEL** - NA
Extinguishing Media – CO_2, Dry Chemical
Special Fire Fighting Procedures – No special procedures required.
Unusual Fire & Explosion Hazards – None Known.

SECTION V – HEALTH HAZARD INFORMATION

Symptoms and Effects of Overexposure – Not listed as a carcinogen by NTP, IARC, or OSHA
Medical Conditions Aggravated by Exposure – None Known

First Aid

Eyes: May cause severe irritation. Immediately flush eyes with large amounts of water for at least 15 minutes while holding the eyelids open. Seek medical attention, if irritation occurs.
Skin: May cause allergic skin reaction. Flush are with cold water. Wash with warm soapy water.
Inhalation: May cause respiratory irritation. If condition persists, seek medical attention.
Ingestion: Contact local Poison Control Center or physician immediately!

SECTION VI – REACTIVITY DATA

Stability – Normally Stable
Incompatible Materials – None known
Hazardous Decomposition Products – None

SECTION VII – SPILL or LEAK PROCEDURES

Procedures – Wear personal protective equipment (see Section VIII). Ventilate area. Dilute with large amounts of water and neutralize with soda ash or lime.
Waste Disposal Method – Dispose of in accordance with Local, State, and Federal Regulations.

SECTION VIII – SPECIAL PROTECTION INFORMATION

Respiratory – Not normally required. If TLV is exceeded, or for symptoms of overexposure, wear a NIOSH approved dust mist respirator.
Eyewear – If splash potential exists, wear chemical splash goggles or faceshield.
Clothing/Gloves – If potential for skin contact exists, wear neoprene or other chemical resistant gloves and apron or coveralls and/or foot coverings, as needed.
Ventilation – Local exhaust may be necessary under some handling/use conditions. Specific needs should be addressed by supervisory or health safety personnel.

The information and recommendations contained in this material safety data sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

MATERIAL SAFETY DATA SHEET
Edwal Hypo-Chek

SECTION I PRODUCT IDENTIFICATION

Trade Name: **Edwal Hypo-Chek** **Date: 04/01/2002**
Product Code(s): **ED-HC-3/4; ED-HC-4**
Manufacturer: Brandess/Kalt/Aetna
701 Corporate Woods Pkwy
Vernon Hills, Il 60061
847-821-4237
Emergency Phone # **Chemtrec 800-424-9300**
Product Form: Liquid Solution
Synonyms: None

SECTION II HAZARDOUS INGREDIENTS

Ingredients	CAS #	%
Potide, potassium salt	7681-11-0	<5%

SECTION III PHYSICAL DATA

Boiling Point (°F)	212°F	**Appearance and Odor**	Clear, colorless liquid, odorless
Vapor Pressure (MM hg)	<2	**Specific Gravity**	1.1
Vapor Density (Air=1)	<1	**pH**	7.1 – 7.5
Solubility In Water	Complete	**Evaporation Rate (Ether =1)**	1

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point – None **Flammable Limits** **LEL** – NA **UEL** - NA
Extinguishing Media – Use media suitable for surrounding materials.
Special Fire Fighting Procedures – Dry chemical, CO_2, or alcohol resistant foam.
Unusual Fire & Explosion Hazards – None Known.

SECTION V – HEALTH HAZARD INFORMATION

Symptoms and Effects of Overexposure – Inhalation of mist may cause respiratory irritation. Skin irritation, redness. Liquid in eyes may cause redness and pain.
Medical Conditions Aggravated by Exposure – None Known

First Aid

Eyes: Immediately flush eyes with large amounts of water for at least 15 minutes while holding the eyelids open. Get prompt medical attention, if irritation persists.
Skin: Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical help if irritation persists.
Inhalation: Move victim to fresh air. Get medical help if irritation persists.
Ingestion: Contact local Poison Control Center or physician immediately!

SECTION VI – REACTIVITY DATA

Stability – Normally Stable
Incompatible Materials – Diazonium salts and oxidants; Metallic salts; Tartaric and other acids.
Hazardous Decomposition Products – None known

SECTION VII – SPILL or LEAK PROCEDURES

Procedures – Wear personal protective equipment (see Section VIII). Clean up with absorbent material.
Waste Disposal Method – Dispose of in accordance with Local, State, and Federal Regulations.

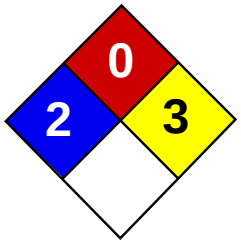
SECTION VIII – SPECIAL PROTECTION INFORMATION

Respiratory – Not normally required. If TLV is exceeded, or for symptoms of overexposure, wear a NIOSH approved respirator for organic vapors.
Eyewear – Wear chemical safety goggles.
Clothing/Gloves – Wear chemical-resistant gloves and clothing as needed to prevent skin contact.
Ventilation – Local exhaust may be necessary under some handling/use conditions. Specific needs should be addressed by supervisory or health safety personnel.

SECTION IX – SPECIAL PRECAUTIONS

Store in a closed container.

The information and recommendations contained in this material safety data sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either alone or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.



Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet

Ferrous sulfate heptahydrate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ferrous sulfate heptahydrate

Catalog Codes: SLF2029, SLF1228

CAS#: 7782-63-0

RTECS: OD5525000

TSCA: TSCA 8(b) inventory: No products were found.

CI#: Not available.

Synonym:

Chemical Name: Ferric Sulfate Heptahydrate

Chemical Formula: FeSO4.7H2O

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ferrous sulfate heptahydrate	7782-63-0	100

Toxicological Data on Ingredients: Ferrous sulfate heptahydrate: ORAL (LD50): Acute: 1520 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to liver. The substance may be toxic to kidneys, cardiovascular system, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Explosive in presence of heat.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep locked up.. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, alkalis.

Storage:
Hygroscopic. Air Sensitive. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 CEIL: 2 Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Not available.

Taste: Not available.

Molecular Weight: 278.01 g/mole

Color: Blue to blue-green. (Light.)

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: 1.898 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatibles

Incompatibility with various substances:
Reactive with oxidizing agents, alkalis. Slightly reactive to reactive with moisture.

Corrosivity: Not available.

Special Remarks on Reactivity:
Hygroscopic. Oxidizes when in contact with mositure to form ferric sulfate. Air Sensitive Incompatible with alkalies, soluble carbonates, Au and Ag salts, Pb acetate, lime water, KI, K, and Na tartrate, Na Borate, tannin, vegetable astringent infusions and decoctions.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 1520 mg/kg [Mouse].

Chronic Effects on Humans:
MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. Causes damage to the following organs: liver. May cause damage to the following organs: kidneys, cardiovascular system, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose LDL [Rat] - Route: Oral; Dose: 1389 mg/kg

Special Remarks on Chronic Effects on Humans:
May affect genetic material (mutagenic). It is excreted in maternal milk in animal.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritation. Inhalation: May cause respiratory tract irritation. Ingestion: Harmful if swallowed. May cause gastrointestinal tract distrubances and irritation with nausea, vomiting, colic, constipation, diarrhea, black stool. May also affect behavior/Central Nervous System (somnolence -general depressed activity), respiration, cardiovascular system, liver, kidneys (pink urine discoloration). Chronic Potential Health Effects: Repeated exposure via ingestion may increase iron levels in the liver, and spleen. Damage may occur to spleen and liver.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut carcinogen reporting list.: Ferrous sulfate heptahydrate Illinois toxic substances disclosure to employee act: Ferrous sulfate heptahydrate New York release reporting list: Ferrous sulfate heptahydrate Pennsylvania RTK: Ferrous sulfate heptahydrate Massachusetts RTK: Ferrous sulfate heptahydrate Massachusetts spill list: Ferrous sulfate heptahydrate New Jersey spill list: Ferrous sulfate heptahydrate Louisiana spill reporting: Ferrous sulfate heptahydrate CERCLA: Hazardous substances.: Ferrous sulfate heptahydrate: 1000 lbs. (453.6 kg)

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 3

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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Last Updated: 05/21/2013 12:00 PM

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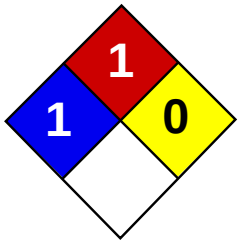

Health	1
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet

Ferric ammonium citrate, green MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ferric ammonium citrate, green

Catalog Codes: SLF1507

CAS#: 1185-57-5

RTECS: GE7540000

TSCA: TSCA 8(b) inventory: Ferric ammonium citrate

CI#: Not available.

Synonym: Ammonium Ferric Citrate; Ammonium iron (III) citrate; Iron (III) ammonium citrate; 1,2,3-Propanetricarboxylic acid, 2-hydroxy, ammonium iron (3+) salt

Chemical Name: Citric Acid, ammonium iron (3+) salt

Chemical Formula: This compound is a complex salt of undetermined structure, composed of Iron, Ammonia, and Citric Acid

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ferric ammonium citrate	1185-57-5	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact:
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Toxic oxides of nitrogen or ammonia gas may be formed in fires.

Special Remarks on Explosion Hazards: Containers may explode when heated.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 STEL: 2 (mg(Fe)/m) [United Kingdom (UK)] TWA: 1 (mg(Fe)/m) from MSHA standardConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance:
S o l i d . (G r a n u l a r s o l i d . P o w d e r e d s o l i d . Deliquescent solid.)

Odor: Odorless.

Taste: Saline, Mild ferruginois taste

Molecular Weight: Not available.

Color: Greenish.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: 1.8 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:

Easily soluble in cold water. Solubility in water: 25 g/100 ml @ 20 deg. C. Practically insoluble in alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, light

Incompatibility with various substances: Not available.

Corrosivity: Not available.

Special Remarks on Reactivity:
Incompatible with iodides, acacia preparations, and tannins. Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc: LD [Rat] - Route: Oral; Dose: >2000 mg/kg

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Contact may cause irritation or rash, particularly with moist skin. Eyes: May cause eye irritation with redness, tearing, and abrasion. Inhalation: Inhalation of high concentrations of dust may cause nasal, throat or lung irritation. Symptoms may include coughing and wheezing. Ingestion: Ingestion can produce gastrointestinal tract irritation with hypermotility, diarrhea. Chronic Potential Health Effects: Eyes: Prolonged eye contact may cause a brownish discoloration of the eyes. Skin: Prolonged skin contact may cause skin irritation.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ferric ammonium citrate Illinois chemical safety act: Ferric ammonium citrate New York release reporting list: Ferric ammonium citrate Pennsylvania RTK: Ferric ammonium citrate Massachusetts RTK: Ferric ammonium citrate Massachusetts spill list: Ferric ammonium citrate New Jersey: Ferric ammonium citrate New Jersey spill list: Ferric ammonium citrate Louisiana spill reporting: Ferric ammonium citrate TSCA 8(b) inventory: Ferric ammonium citrate CERCLA: Hazardous substances.: Ferric ammonium citrate: 1000 lbs. (453.6 kg)

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
This product is not classified according to the EU regulations. Not applicable.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 05:32 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheet
Hydrogen Peroxide Solution

(Hydrogen Peroxide, 30%)

Print Date: September 2011

SECTION 1 – Chemical Product and Company Identification

MSDS Name: Hydrogen Peroxide Solution MSDS Preparation Date: 09-2011, Supersedes 05-2009, 07-2008, 02-2007 & 08-2004

Synonyms: Dihydrogen dioxide, hydrogen dioxide, hydroperoxide, hydrogen peroxide
Chemical Names: DE Wasserstoffperoxid in Lösung; ES Peróxido de hidrógeno en disolución (Agua oxigenada); FR Peroxyde d'hydrogène en solution (Eau oxygénée); IT Perossido di idrogeno soluzione (Acqua ossigenata); NL Waterstofperoxide in oplossing
UN / NA Number: UN2014
Formula: H_2O_2
Molecular Wt: 34.01

Product numbers: S021001, S021001-SSNF03, S021001-SSNF04

Supplier: Seastar Chemicals Inc, PO Box 2219, 2045 Mills Road West, Sidney, BC, Canada V8L 3S8
Tel: (250) 655-5880, Fax: (250) 655-5888

CANUTEC (CAN): (613)-996-6666

SECTION 2 – Composition/Information on Ingredients

Chemical Name	*Percent*	*CAS #*	*EINECS/ELINCS*
Hydrogen Peroxide	30-32%	7722-84-1	231-765-0
Water	Balance	7732-18-5	231-791-2

SECTION 3 – Hazards Identification

EMERGENCY OVERVIEW

Appearance: Clear, colourless liquid with a slightly sharp and irritating odour. Will not burn. MODERATE OXIDIZER. Contact with combustible materials may cause fire or explosion. CORROSIVE to the eyes. May cause permanent injury including blindness. Corrosive to steel, iron, nickel, copper and its alloys.
Target Organs: Blood, central nervous system, eyes.

Potential Health Effects

Primary Route(s) of Entry: Inhalation. Eye contact. Skin contact.
Effects of Acute Exposure: Corrosive. Causes severe eye burns. Irritating to skin, eyes and respiratory system.
LD50/LC50: CAS# 7722-84-1: Inhalation, rat: LC50 = 2 gm/m^3/4H; Oral, rat: LD50 = 910 mg/kg. CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg.
Inhalation: Hydrogen peroxide does not readily form a vapour at room temperature. If heated or misted, it is irritating to the nose, throat and respiratory tract, based on limited human and animal information. In very severe cases, bronchitis or a potentially life-threatening accumulation of fluid in the lungs (pulmonary edema) may occur. However, no reports of these effects in humans were located.
Eyes: Hydrogen peroxide solutions of 20% to less than 35% are corrosive to eyes based on animal information. Corrosive materials are capable of producing severe eye burns, and permanent injury, including blindness, depending on the concentration of the solutions and duration of contact. No human information was located for hydrogen peroxide solutions of 20% to less than 35%. Direct contact with dilute solutions (up to 3%) has not resulted in permanent eye injury.
Skin: Hydrogen peroxide solutions of 20% to less than 35% are very mild skin irritants based on animal information. Prolonged contact (e.g. 24-hours) can cause moderate to severe irritation. Whitening or bleaching of the skin has been observed in humans following contact with dilute solutions. Exposure to 35% hydrogen peroxide may result in redness and an eruption of gas bubbles under the skin described as being similar to bubble wrap; however, the skin eruptions heal rapidly without scarring following treatment.
Ingestion: Case reports of non-occupational ingestion of hydrogen peroxide describe symptoms such as sharp pains in the abdomen, foaming at the mouth, vomiting, temporary unconsciousness and fever. Sensory and motor impairment have also been described. Concentrated solutions (greater than 20%) irritate the gastrointestinal tract and may cause corrosive injury and death. Hydrogen peroxide reacts in the stomach releasing large amounts of oxygen. Ingestion is not a typical route of occupational exposure.

Effects of Chronic Exposure: Prolonged or repeated exposure may cause eye and throat irritation, corneal damage, dermatitis, and gradual bleaching of hair.

SECTION 4 – First Aid Measures

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air. If symptoms persist, immediately obtain medical attention.
Eyes: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens until flushing is done. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. If necessary, continue flushing during transport to emergency care facility. Quickly transport victim to an emergency care facility.
Skin: Remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately flush with lukewarm, gently flowing water for 15-20 minutes. Obtain medical advice. Completely decontaminate clothing, shoes and leather goods before re-use or discard. Keep contaminated clothing under water in a closed container until it can be safely discarded.
Ingestion: NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim rinse mouth with water again. Immediately obtain medical attention.
Notes to Physician: Consult a doctor and/or the nearest Poison Control Centre for all exposures except minor instances of inhalation or skin contact. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its condition of use in the workplace. Attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. In the event of severe distension of the stomach or esophagus due to gastric formation, insertion of a gastric tube may be required.

SECTION 5 – Fire Fighting Measures

General Information: Hydrogen peroxide solutions, 20% to less than 35%, do not burn, but are moderate to strong oxidizing agents. Concentrations of 27.5% and above can cause combustible materials such as wood, paper, oils and grease to burst into flames and will support, accelerate and intensify the burning of combustible materials in a fire. Some substances that do not normally burn in air will ignite or explode upon contact with hydrogen peroxide. Closed containers may rupture violently due to rapid decomposition, if exposed to fire or excessive heat for a sufficient period of time, or if contaminated with certain metals or dirt. Large amounts of oxygen gas may be released to form an oxygen-rich atmosphere. No part of a container should be subjected to a temperature higher than 49 °C (120 °F). Firefighter's normal protective equipment (Bunker Gear) will not provide adequate protection. Chemical protective clothing (e.g. chemical splash suit) and positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.
Extinguishing Media: Use extinguishing media suitable for the surrounding fire. Use large quantities of water as fog to fight fires in which this material is involved. Some chemical extinguishing agents may accelerate decomposition. Carbon dioxide or other extinguishing agents that smother flames are not effective on oxidizers.
Auto-ignition Temperature: Not applicable.
Flash Point: Does not burn, but is a moderate oxidizing material and can increase the risk of fire or the intensity of a fire.
NFPA Rating: Health 3; Flammability 0; Reactivity 1; Other OXIZIDING MATERIAL (listed under Hydrogen Peroxide, aqueous solutions (40% to 60%))
Explosion Limits: Lower: 40 vol %. Upper: 100 vol %.

SECTION 6 – Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spill Precautions: Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Ventilate area. Eliminate all ignition sources. Remove all flammable and combustible materials. Notify government environmental agencies if material is released into the environment.
Clean-up: Do not touch spilled material. Stop or reduce leak if safe to do so. Prevent material from entering sewers, waterways or confined spaces. Keep materials that can burn away from spilled material. SMALL SPILLS: Flush area with water. LARGE SPILLS: Dike with earth, sand or inert absorbent material to contain spill. Remove liquid with compatible pumps or vacuum equipment. Place in suitable, covered, labelled, vented containers. Flush area with excess water.
Waste disposal method: According to all applicable regulations. Avoid run-off.

SECTION 7 – Handling and Storage

Handling: This material is a CORROSIVE (to metals and eyes), MODERATE OXIDIZING liquid. Wear appropriate personal protective equipment, if necessary, to prevent eye contact. No contact with materials that can burn. Eliminate all ignition sources. Immediately report leaks, spills or failures of the engineering controls. Prevent contamination of peroxide solutions by any source including dust, metals and organic materials. Do not perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all material has been cleared. Do not allow water to evaporate from the solution. Replace water and maintain levels of stabilizer. Consider using closed handling systems for processes involving this material. Avoid generating vapours or mists. Prevent the release of vapours or mists into the air.
Inspect containers for damage or leaks before handling. Label containers. Cautiously, dispense into sturdy containers made of compatible materials. Use corrosion-resistant transfer equipment when dispensing. Add to cold water slowly, in small amounts and stir frequently to avoid excessive heat

generation. Never transfer by pressurizing the original shipping container with air or inert gas. Do not return unused or contaminated material to the original container. Do not use with incompatible materials such as organic compounds (e.g. alcohols, ethers). See Section 10 for more information. Do not allow contact with materials such as cleaning solvents, paints or thinners. Keep containers closed when not in use. Always assume that empty containers contain hazardous residues. Never reuse empty containers, even if they appear to be clean. Have suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping.

Storage: Store below 35 °C. Store in a cool, well-ventilated area, out of direct sunlight, away from heat and ignition sources and away from combustible materials. When storing large quantities, store in an isolated, fireproof building, if possible. Keep quantities stored as small as possible. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Storage facilities should be made of fire resistant materials. Stainless steel (#316) is one material recommended for storage vessels and piping.

Store away from incompatible materials, such as organic compounds. See Section 10 for more information. Store in suitable, labelled containers (usually the shipping container). Containers should be equipped with an adequately sized vent or other relief device to prevent overpressurization due to decomposition or fire exposure. Protect from damage. Have appropriate fire extinguishers and spill clean-up equipment in storage area. Contain spills or leaks by storing in trays made from compatible materials. Keep absorbents for leaks readily available.

SECTION 8 – Exposure Control/Personal Protection

Engineering Controls: Engineering methods to control hazardous conditions are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions and process modification (e.g. substitution of a less hazardous material). Because of the high potential hazard associated with this substance, stringent control measures such as enclosure or isolation should be considered for large scale operations. A totally enclosed system with an associated purging system should be considered for unloading bulk hydrogen peroxide and sampling process liquids. To prevent the release of hydrogen peroxide due to equipment failure, backup controls (e.g. double mechanical seals for process pumps) should be considered. Supply sufficient replacement air to make up for air removed by exhaust systems. Do not use organic or combustible materials such as wood in the construction of ventilation or control systems.

Exposure Limits:

Chemical Name	*ACGIH*	*NIOSH*	*OSHA*
Hydrogen Peroxide	1 ppm TWA	1 ppm (1.4 mg/m^3) TWA; 75 ppm IDLH	1 ppm (1.4 mg/m^3) TWA

Personal Protective Equipment

Eye/Face Protection: Chemical safety goggles suitable for splash protection and/or a face shield as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Have an eye-wash fountain readily available in the immediate work area.

Skin Protection: Wear impervious gloves and appropriate protective clothing. Choose body protection according to the amount and concentration of the substance at the work place.

Resistance of Materials for Protective Clothing: No specific information for dilute solutions.

Guidelines for hydrogen peroxide 30-70%: RECOMMENDED (resistance to breakthrough longer than 8 hours): Rubber - butyl, natural or nitrile; Polyethylene; Viton®; Tychem® CPF 3, BR/LV, Responder®, or TK. RECOMMENDED (resistance to breakthrough longer than 4 hours): Polyvinyl chloride; Silver Shield/4H® (polyethylene/ethylene vinyl alcohol). CAUTION, use for short periods only (resistance to breakthrough within 1 to 4 hours): Neoprene rubber. NOT RECOMMENDED for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol.

Inhalation/Ventilation: Use in a chemical fume hood. Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Personal Hygiene: Remove contaminated clothing promptly. Drying of concentrated material on clothing may cause fire. Immerse contaminated clothing in water, and keep thoroughly wet until discarded or laundered. Inform laundry personnel of contaminant's hazards. Do not eat, drink or smoke in work areas. Wash hands thoroughly after handling this material. Maintain good housekeeping.

SECTION 9 – Physical and Chemical Properties

Physical State: Liquid
Appearance: Clear, colourless
Odour: Sharp, irritating odour
pH Value: Slightly acid to litmus paper.
Vapour Pressure: 35% (w/w): 18 mm Hg @ 30°C
Vapour Density: 1.2 (air=1)
Evaporation Rate: Not available
Viscosity: 1.11 mPa·s @ 20°C
Boiling Point: 20% (w/w): 103.6 °C (218.5 °F); 30% (w/w): 106.2 °C (223.2 °F); 35% (w/w): 108 °C (226 °F)
Freezing/Melting Point: 20% (w/w): -14.6 °C (5.7 °F); 30% (w/w): -25.7 °C (-14.3 °F); 35% (w/w): -33.0 °C (-27.4 °F)
Specific Gravity/Density: 20% (w/w): 1.07; 30% (w/w): 1.11 @ 25 °C; 35% (w/w): 1.113 @ 20 °C
Solubility: Soluble in all proportions in water. Soluble in all proportions in many polar solvents, e.g. low molecular weight alcohols, glycols and ketones; insoluble in petroleum ether. (NOTE: Concentrated hydrogen peroxide solutions can react explosively with these solvents.)
Molecular Formula: H_2O_2
Molecular Weight: 34.0128

SECTION 10 – Stability and Reactivity

Chemical Stability: Solutions that are completely free of contamination are relatively stable. Stability depends upon many factors including temperature, pH, and the presence of impurities. Alkaline solutions are less stable than acidic ones (the optimum pH is 3.5-4.5). Can decompose in sunlight. Hydrogen peroxide readily liberates oxygen, water and heat. May attack or ignite some forms of plastics, rubber, or coatings.
Conditions to Avoid: Heat, open flames, contamination, depletion of stabilizers, pH > 4.5.
Incompatibilities with Other Materials: Hydrogen peroxide solutions (30% or greater) are strong oxidizing agents capable of reacting explosively with many substances. Some organic compounds form unstable peroxides.

COMBUSTIBLE MATERIALS (e.g. wood, paper, textiles, oil, grease) - may cause fire or explosion upon contact.
STRONG BASES (e.g potassium hydroxide or sodium hydroxide) - can explode violently.
NITRIC ACID (more than 50%) or SULFURIC ACID - mixtures with 35% and above hydrogen peroxide can explode violently.
ORGANIC COMPOUNDS (e.g. carboxylic acids and anhydrides, nitrogen-containing bases, aldehydes, ketones, ethers, alcohols, charcoal, organic dust) – spontaneous combustion, violent decomposition and/or explosion may occur.
METALS (powdered or metal surfaces), METAL OXIDES, METAL SULFIDES METAL SALTS, or IODATES - may cause violent decomposition.
REDUCING AGENTS (e.g. metal hydrides) - may react violently.
POTASSIUM PERMANGANATE - can explode when in contact with very concentrated hydrogen peroxide.

Combustion and Thermal Decomposition Products: Decomposes to molecular oxygen, which can accelerate the burning of flammable materials or cause spontaneous combustion.
Hazardous Polymerization: Will not occur.

SECTION 11 – Toxicological Information

RTECS: CAS# 7722-84-1: MX0887000; MX0888000; MX0890000; MX0899000; MX0899500; MX0900000. CAS# 7732-18-5: ZC0110000.
LD50/LC50: CAS# 7722-84-1: Oral, rat: LD50 = 910 mg/kg; Skin, rat: LD50 = 3 gm/kg; Intravenous, mouse: LD50 = >50 gm/kg; Oral, rabbit: LD50 = 820 mg/kg. CAS# 7732-18-5: Oral, rat: LD50 = >90 mL/kg.
Carcinogenicity: CAS# 7722-84-1: Oral, mouse: TDLo = 622 gm/kg/2Y (continuous). ACGIH: A3 - Animal carcinogen; IARC: IARC Group 3 - Not classifiable; NTP: Not listed. CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology: No human information available.
Teratogenicity: No human information available.
Reproductive Effects: No human information available.
Neurotoxicity: No information available.
Mutagenicity: CAS#: 7722-84-1 Mutation in microorganisms: *S. typhimurium* = 4400 umol/plate.; Hyman, embryo = 50 umol/L.; Cytogenetic Analysis: Human, embryo = 20 umol/L. Mutation in Mammalian Somatic Cells: Hamster, lung = 1 mmol/L.
Other Studies: No data available.

SECTION 12 – Ecological Information

Ecotoxicity: Carp: LC50 = 42 mg/L/48H. Channel catfish: LC50 = 37.4 mg/L/96H. Fathead minnow: LC50 = 16.4 mg/L/96H (fresh water). Water flea: EC50 = 2.4 mg/L/48H (fresh water).
Environmental: Rain washout is expected due to condensation of hydrogen peroxide on contact with water droplets. In the atmosphere, indirect photooxidation is predicted with a half-life of 10-20 hours. Non-significant evaporation and adsorption from water surfaces and soil/sediments is expected. Rapid and considerable aerobic biodegradation was determined with a half-life < 1 minute (biological treatment sludge) and 0.3-2 days (fresh water).
Physical: No information available.
Other: No information available.

SECTION 13 – Disposal Considerations

Dispose of in a manner consistent with federal, provincial/state/territorial, and local regulations.
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series: None listed.

SECTION 14 – Transport Information

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG) SHIPPING INFORMATION

Proper Shipping Name: HYDROGEN PEROXIDE, AQUEOUS SOLUTION with not less than 20 per cent but not more than 60 per cent hydrogen peroxide (stabilized as necessary)

UN Number: UN2014	Hazard Class: 5.1, 8	Packing Group/Category: II
Special Provisions: ---	Passenger Carrying Road/Rail Limit: 1 kg or L	Marine Pollutant: ---

NOTE: This information incorporates the Transportation of Dangerous Goods Regulations SOR/2001-286, effective October 14, 2009.

US DEPARTMENT OF TRANSPORT (DOT) HAZARDOUS MATERIALS SHIPPING INFORMATION (49 CFR)

Shipping Name and Description: HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS with not less than 20 percent but not more than 40 percent hydrogen peroxide (stabilized as necessary)
Identification Number: UN2014 Hazard Class or Division: 5.1 Packing Group: II

NOTE: This information was taken from the US Code of Federal Regulations Title 49 - Transportation and is effective October 2003.

IATA (1 January – 31 December 2010)

UN/ID No. A	Proper Shipping Name / Description B	Class or Div. (Sub Risk) C	Hazard Label(s) D	PG E	Passenger and Cargo Aircraft		Cargo Aircraft Only		S.P. See 4.4 M
					Pkg Inst I	Max Net Qty/Pkg J	Pkg Inst K	Max/Net Qty/Pkg L	
2014	Hydrogen peroxide, aqueous solution with 20% or more but 40% or less hydrogen peroxide (stabilized as necessary)	5.1 (8)	Oxidizer & Corrosive	II	501	1 L	506	5 L	

NOTE: Consult IATA DG Regulations for the most recent information, abbreviations and reference marks.

SECTION 15 – Regulatory Information

US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)
OSHA Hazard Communication Evaluation: Meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

US Federal

TSCA: CAS# 7722-84-1 is listed on the TSCA inventory. CAS# 7732-18-5 is listed on the TSCA inventory.
Health & Safety Reporting List: None of the components are on this list.
Chemical Test Rules: None of the components are on this list.
TSCA Section 12b: None of the components are on this list.
TSCA Significant New Use Rule (SNUR): None of the components are on this list.
CERCLA Reportable Quantities (RQ): None of the components have an RQ.
SARA Threshold Planning Quantities (TPQ): CAS# 7722-84-1: TPQ = 1,000 lbs (concentration > 52%).

SARA Hazard Categories: CAS # 7722-84-1: Acute, flammable.
SARA Section 313: No components are reportable under Section 313 of SARA Title III and 40 CFR Part 373.
Clean Air Act: This material does not contain any Hazardous Air Pollutants, Class 1 Ozone Depletors, or Class 2 Ozone Depletors.
Clean Water Act: None of the components in this product are listed as Hazardous Substances, Priority Pollutants, or Toxic Pollutants under the CWA.
OSHA: None of the components are considered highly hazardous by OSHA.

US State

State Right to Know: CAS# 7722-84-1 can be found on the following state Right-to-Know lists: California, New Jersey (RTK# 1015), Pennsylvania, Minnesota, Massachusetts (1 lbs RQ).

California Prop 65: None of the components are listed.
California No Significant Risk Level: None of the components are listed.

CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)
CCOHS WHMIS Classification:

C - Oxidizing material
D2B - Poisonous and infectious material - Other effects - Toxic
E - Corrosive material

WHMIS Health Effects Criteria Met by this Chemical: D2B - Eye irritation - toxic - other, E - TDG class 8 - corrosive substance
WHMIS Ingredient Disclosure List: Included for disclosure at 1% or greater.

Detailed WHMIS Classification According to Criteria:

Class A - Compressed Gas: Does not meet criteria.
Class B - Flammable and Combustible Material: Does not meet criteria. Not combustible (does not burn).
Class C - Oxidizing Material: Meets criteria. NFPA Class 1 and Class 2 oxidizer; TDG Class 5.1.
Class D - Poisonous and Infectious Material. Division 1 - Immediate and Serious Toxic Effects: Insufficient information for classification.
Acute Lethality: Insufficient information.
Class D - Poisonous and Infectious Material. Division 2 - Other Toxic Effects: Meets criteria for "Toxic material". See detailed evaluation below.
Chronic Health Effects: Insufficient information. Liver damage observed in mice administered 0.15% (approximately 230 mg/kg/day) in their drinking water for 16 weeks.
Carcinogenicity: Does not meet criteria. IARC Group 3. ACGIH A3.
Teratogenicity and Embryotoxicity: Insufficient information. No conclusions can be drawn based on the limited animal information available.
Mutagenicity: Does not meet criteria. Negative results obtained in live animals.
Respiratory Tract Sensitization: Does not meet criteria. Not reported as a human respiratory sensitizer.
Skin Irritation: Does not meet criteria. Solutions of 20% to less than 35% are classified as corrosive (TDG 8 and corrosive to metals). However, a 4-hour exposure to 35% hydrogen peroxide solution has caused only very mild skin irritation in animals.
Eye Irritation: "Toxic". Solutions of 20% to less than 35% have caused corrosive effects in animals.
Skin Sensitization: Insufficient information. No conclusions can be drawn from one occupational case report; negative in an animal test.

Class E - Corrosive Material: Meets criteria.

TDG Class 8. Not corrosive to skin. Corrosive to carbon steel alloy 1020 at any concentration and any temperature, but not corrosive to aluminum metal and certain aluminum alloys (1060, 5052, 6063 and aluminum-magnesium alloys). No information on the corrosivity to aluminum alloy 7075-T6 was located.

Class F - Dangerously Reactive Material: Does not meet criteria. More concentrated solutions can decompose vigorously or explosively.

Canadian DSL/NDSL: CAS# 7722-84-1 is listed on Canada's DSL List. CAS# 7732-18-5 is listed on Canada's DSL List.

EUROPEAN UNION (EU) CLASSIFICATION AND LABELLING INFORMATION

EU Index#: 008-003-00-9

EU Classification: Serious eye damage – Category 1
Acute toxicity, Oral – Category 4
Acute toxicity, Inhalation – Category 4

EU Signal Word: Danger

EU Pictograms:

GHS05

GHS07

EU Hazard Statements:

H318: Causes serious eye damage.

H302: Harmful if swallowed.

H332: Harmful if inhaled.

EU Precautionary Statements:

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P264: Wash thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P330: Rinse mouth.

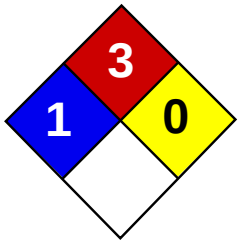
P501: Dispose of contents/container according to federal, regional and local government requirements.

Exposure Limits:

CAS# 7722-84-1: OEL-AUSTRALIA: TWA 1 ppm (1.4 mg/m^3)
OEL-BELGIUM: TWA 1 ppm (1.4 mg/m^3)
OEL-DENMARK: TWA 1 ppm (1.4 mg/m^3)
OEL-FINLAND: TWA 1 ppm (1.4 mg/m^3); STEL 3 ppm (4.2 mg/m^3)
OEL-FRANCE: VME 1 ppm (1.5 mg/m^3)
OEL-GERMANY: TWA 1 ppm (1.4 mg/m^3)
OEL-KOREA: TWA 1 ppm (1.5 mg/m^3)
OEL-MEXICO: TWA 1 ppm (1.5 mg/m^3);STEL 2 ppm (3 mg/m^3)
OEL-THE NETHERLANDS: TWA 1 ppm (1.4 mg/m^3)
OEL-NEW ZEALAND: TWA 1 ppm (1.4 mg/m^3)
OEL-NORWAY: TWA 1 ppm (1.4 mg/m^3)
OEL-POLAND: TWA 1.5 mg/m^3, STEL 4 mg/m^3
OEL-THE PHILIPPINES: TWA 1 ppm (1.4 mg/m^3)
OEL-SWEDEN: TWA 1 ppm (1.4 mg/m^3), CL 2 ppm (3 mg/m^3)
OEL-SWITZERLAND: MAK-W 0.5 ppm (0.71 mg/m^3), KZG-W 0.5 ppm (0.71 mg/m^3)
OEL-TURKEY: TWA 1 ppm (1.4 mg/m^3)
OEL-UNITED KINGDOM: TWA 1 ppm (1.4 mg/m^3); STEL 2 ppm
OEL IN ARGENTINA, BULGARIA, COLOMBIA, JORDAN check ACGIH TLV;
OEL IN SINGAPORE, VIETNAM check ACGIH TLV

SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.



Health	2
Fire	3
Reactivity	0
Personal Protection	H

Material Safety Data Sheet
Isopropyl alcohol MSDS

Section 1: Chemical Product and Company Identification

Product Name: Isopropyl alcohol

Catalog Codes: SLI1153, SLI1579, SLI1906, SLI1246, SLI1432

CAS#: 67-63-0

RTECS: NT8050000

TSCA: TSCA 8(b) inventory: Isopropyl alcohol

CI#: Not available.

Synonym: 2-Propanol

Chemical Name: isopropanol

Chemical Formula: C3-H8-O

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Isopropyl alcohol	67-63-0	100

Toxicological Data on Ingredients: Isopropyl alcohol: ORAL (LD50): Acute: 5045 mg/kg [Rat]. 3600 mg/kg [Mouse]. 6410 mg/kg [Rabbit]. DERMAL (LD50): Acute: 12800 mg/kg [Rabbit].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. The substance may be toxic to kidneys, liver, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 399°C (750.2°F)

Flash Points: CLOSED CUP: 11.667°C (53°F) - 12.778 deg. C (55 deg. F) (TAG)

Flammable Limits: LOWER: 2% UPPER: 12.7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Flammable in presence of oxidizing materials. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME. Hydrogen peroxide sharply reduces the autoignition temperature of Isopropyl alcohol. After a delay, Isopropyl alcohol ignites on contact with dioxgenyl tetrafluorborate, chromium trioxide, and potassium tert-butoxide. When heated to decomposition it emits acrid smoke and fumes.

Special Remarks on Explosion Hazards:
Secondary alcohols are readily autooxidized in contact with oxygen or air, forming ketones and hydrogen peroxide. It can become potentially explosive. It reacts with oxygen to form dangerously unstable peroxides which can concentrate and explode during distillation or evaporation. The presence of 2-butanone increases the reaction rate for peroxide formation. Explosive in the form of vapor when exposed to heat or flame. May form explosive mixtures with air. Isopropyl alcohol + phosgene forms isopropyl chloroformate and hydrogen chloride. In the presence of iron salts, thermal decompositon can occur, whicn in some cases can become explosive. A homogeneous mixture of concentrated peroxides + isopropyl alcohol are capable of detonation by shock or heat. Barium perchlorate + isopropyl alcohol gives the highly explosive alkyl perchlorates.

It forms explosive mixtures with trinitormethane and hydrogen peroxide. It produces a violent explosive reaction when heated with aluminum isopropoxide + crotonaldehyde. Mixtures of isopropyl alcohol + nitroform are explosive.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:
Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Avoid contact with eyes. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids.

Storage:
Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 983 STEL: 1230 (mg/m3) [Australia] TWA: 200 STEL: 400 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 980 STEL: 1225 (mg/m3) from NIOSH TWA: 400 STEL: 500 (ppm) from NIOSH TWA: 400 STEL: 500 (ppm) [United Kingdom (UK)] TWA: 999 STEL: 1259 (mg/m3) [United Kingdom (UK)] TWA: 400 STEL: 500 (ppm) from OSHA (PEL) [United States] TWA: 980 STEL: 1225 (mg/m3) from OSHA (PEL) [United States]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor:
Pleasant. Odor resembling that of a mixture of ethanol and acetone.

Taste: Bitter. (Slight.)

Molecular Weight: 60.1 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 82.5°C (180.5°F)

Melting Point: -88.5°C (-127.3°F)

Critical Temperature: 235°C (455°F)

Specific Gravity: 0.78505 (Water = 1)

Vapor Pressure: 4.4 kPa (@ 20°C)

Vapor Density: 2.07 (Air = 1)

Volatility: Not available.

Odor Threshold:
22 ppm (Sittig, 1991) 700 ppm for unadapted panelists (Verschuren, 1983).

Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, n-octanol, acetone.

Solubility:
Easily soluble in cold water, hot water, methanol, diethyl ether, n-octanol, acetone. Insoluble in salt solution. Soluble in benzene. Miscible with most organic solvents including alcohol, ethyl alcohol, chloroform.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, Ignition sources, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts violently with hydrogen + palladium combination, nitroform, oleum, COCl2, aluminum triisopropoxide, oxidants Incompatible with acetaldehyde, chlorine, ethylene oxide, isocyanates, acids, alkaline earth, alkali metals, caustics, amines, crotonaldehyde, phosgene, ammonia. Isopropyl alcohol reacts with metallic aluminum at high temperatures. Isopropyl alcohol attacks some plastics, rubber, and coatings. Vigorous reaction with sodium dichromate + sulfuric acid.

Special Remarks on Corrosivity: May attack some forms of plastic, rubber and coating

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3600 mg/kg [Mouse]. Acute dermal toxicity (LD50): 12800 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 16000 8 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. May cause damage to the following organs: kidneys, liver, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive/teratogenic effects (fertility, fetoxicity, developmental abnormalities(developmental toxin)) based on animal studies. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause mild skin irritation, and sensitization. Eyes: Can cause eye irritation. Inhalation: Breathing in small amounts of this material during normal handling is not likely to cause harmful effects. However, breathing large amounts may be harmful and may affect the respiratory system and mucous membranes (irritation), behavior and brain (Central nervous system depression - headache, dizziness, drowsiness, stupor, incoordination, unconciousness, coma and possible death), peripheral nerve and senstation, blood, urinary system, and liver. Ingestion: Swallowing small amouts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Swallowing large amounts may cause gastrointestinal tract irritation with nausea, vomiting and diarrhea, abdominal pain. It also may affect the urinary system, cardiovascular system, sense organs, behavior or central nervous system (somnolence, generally depressed activity, irritability, headache, dizziness, drowsiness), liver, and respiratory system (breathing difficulty). Chronic Potential Health Effects: May cause defatting of the skin and dermatitis and allergic reaction. May cause adverse reproductive effects based on animal data (studies).

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 100000 mg/l 96 hours [Fathead Minnow]. 64000 mg/l 96 hours [Fathead Minnow].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Isopropyl Alcohol UNNA: 1219 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Isopropyl alcohol Illinois toxic substances disclosure to employee act: Isopropyl alcohol Rhode Island RTK hazardous substances: Isopropyl alcohol Pennsylvania RTK: Isopropyl alcohol Florida: Isopropyl alcohol Minnesota: Isopropyl alcohol Massachusetts RTK: Isopropyl alcohol New Jersey: Isopropyl alcohol New Jersey spill list: Isopropyl alcohol Director's list of Hazardous Substances: Isopropyl alcohol Tennesee: Isopropyl alcohol TSCA 8(b) inventory: Isopropyl alcohol TSCA 4(a) final testing order: Isopropyl alcohol TSCA 8(a) IUR: Isopropyl alcohol TSCA 8(d) H

and S data reporting: Isopropyl alcohol: Effective date: 12/15/86 Sunset Date: 12/15/96 TSCA 12(b) one time export: Isopropyl alcohol SARA 313 toxic chemical notification and release reporting: Isopropyl alcohol

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R36- Irritating to eyes. S7- Keep container tightly closed. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 3

Reactivity: 0

Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 3

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/09/2005 05:53 PM

Last Updated: 05/21/2013 12:00 PM

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Material Safety Data Sheets

MSDS Product Name: KODAK Fixer

MATERIAL SAFETY DATA SHEET

200000569/F/USA
Approval Date: 12/23/1998
Print Date: 05/27/2000
Page 1

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KODAK Fixer

Catalog Number(s):
123 4699 - To Make 32 ounce(s)
123 8146 - To Make 128 ounce(s)
197 1720 - To Make 1 quart (U.S.)
197 1738 - To Make 1/2 gallon (U.S.)
197 1746 - To Make 1 gallon (U.S.)
197 1753 - To Make 5 gallons (U.S.)

Manufacturer/Supplier: EASTMAN KODAK COMPANY, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (716) 722-5151

For other information or to request an MSDS, call (800) 242-2424.

Synonym(s): Concentrate: KAN 354617; PCD 6010; D-0006.000
Working solution: KAN 965822

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight % - Component - (CAS Registry No.)

Concentrate:

70-75	Sodium thiosulfate (007772-98-7)
10-15	Ammonium alum, dodecahydrate (007784-25-0)
5-10	Sodium acetate (000127-09-3)
5-10	Sodium metabisulfite (007681-57-4)
1-5	Boric anhydride (001303-86-2)

Working solution:

75-80	Water (007732-18-5)
10-15	Sodium thiosulfate (007772-98-7)
1-5	Ammonium alum, dodecahydrate (007784-25-0)
1-5	Sodium acetate (000127-09-3)
1-5	Sodium bisulfite (007631-90-5)

---

3. HAZARDS IDENTIFICATION

Concentrate:

CONTAINS: sodium metabisulfite (007681-57-4)
WARNING!
REDUCING AGENT
MAY BE HARMFUL IF INHALED OR SWALLOWED

MAY LIBERATE SULFUR DIOXIDE
DUST IRRITATING TO RESPIRATORY TRACT
CAUSES EYE IRRITATION
POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES

HMIS Hazard Ratings:
Health - 1 , Flammability - 1, Reactivity - 0, Personal Protection - B

NFPA Hazard Ratings:
Health - 2, Flammability - 1, Reactivity (Stability) - 0

Working solution:

CONTAINS: sodium bisulfite (007631-90-5)
WARNING!
MAY BE HARMFUL IF INHALED OR SWALLOWED

HMIS Hazard Ratings:
Health - 0 , Flammability - 1, Reactivity - 0, Personal Protection - B

NFPA Hazard Ratings:
Health - 1, Flammability - 1, Reactivity (Stability) - 0

NOTE: HMIS and NFPA hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. The personal protection index is only intended for general guidance on personal protection equipment (PPE) that is suitable for the potential hazards of the material. PPE (e.g., respirators) may not be needed if engineering controls (e.g., local ventilation) are adequate. An asterisk (*), in the HMIS health field, designates potential chronic or target organ hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

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4. FIRST-AID MEASURES

Inhalation: If symptomatic, move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

Eyes:

Concentrate: Immediately flush with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.

Working solution: Any material that contacts the eye should be washed out immediately with water. Get medical attention if symptoms occur.

Skin: Wash with soap and water. Get medical attention if symptoms occur.

Ingestion: Drink 1-2 glasses of water. Seek medical attention. Never give anything by mouth to an unconscious person.

---

5. FIRE FIGHTING MEASURES

Extinguishing Media:

Concentrate: Flood with water.

Working solution: Water spray, carbon dioxide (CO_2), dry chemical, alcohol foam

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products:

Concentrate: Carbon dioxide, carbon monoxide, oxides of sulfur, oxides of nitrogen (see also Hazardous Decomposition Products section)

Working solution: Carbon dioxide, carbon monoxide, oxides of sulfur (see also Hazardous Decomposition Products section)

Unusual Fire and Explosion Hazards:

Concentrate: Powdered material may form explosive dust-air mixtures. Reducing agent. Greatly increases the burning rate of combustible materials.

Working solution: Dried product residue can act as a reducing agent.

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6. ACCIDENTAL RELEASE MEASURES

Concentrate: Flush to sewer with large amounts of water. Otherwise, sweep up and place in a container for chemical waste. Collect in a noncombustible container for prompt disposal. Clean surface thoroughly to remove residual contamination.

Working solution: Flush to sewer with large amounts of water. Clean surface thoroughly to remove residual contamination.

---

7. HANDLING AND STORAGE

Personal Precautionary Measures: Avoid breathing dust or vapor. Avoid contact with eyes and prolonged or repeated contact with skin. Use with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion:

Concentrate: Powdered material may form explosive dust-air mixtures. Minimize dust generation and accumulation. Use with adequate ventilation. Keep away from sources of ignition. Refer to NFPA Pamphlet No. 654, "Prevention of Fire and Dust Explosions in the Chemical, Dye, Pharmaceutical, and Plastics Industries." Keep from contact with oxidizing materials, highly oxygenated or halogenated solvents, organic compounds containing reducible functional groups, or aqueous ammonia. Keep away from combustible material. Remove and wash contaminated clothing promptly.

Working solution: Keep from contact with oxidizing materials.

Storage:

Concentrate: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section). Do not store or ship together with combustible materials. Store in original container.

Working solution: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section).

---

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

ACGIH Threshold Limit Value (TLV):

Ammonium alum, dodecahydrate: 2 mg/m3 TWA, as Al soluble salts
Boric anhydride: 10 mg/m3 TWA
Sodium metabisulfite: 5 mg/m3 TWA

Sodium bisulfite: 5 mg/m3 TWA
Sulfur dioxide: 2 ppm TWA; 5 ppm STEL

OSHA (USA) Permissible Exposure Limit (PEL - 1971 Table Z-1 Values):

Boric anhydride: 15 mg/m3 TWA, total dust

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.

Respiratory Protection:

Concentrate: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: Dust. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: Acid gas. See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

Working solution: None should be needed. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: Acid gas. See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

Eye Protection: Wear safety glasses with side shields (or goggles).

Skin Protection: It is a good industrial hygiene practice to minimize skin contact. For operations where prolonged or repeated skin contact may occur, impervious gloves should be worn.

Recommended Decontamination Facilities: Eye bath, washing facilities, safety shower

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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:
- Concentrate: Solid (powder)
- Working solution: Liquid

Color:
- Concentrate: White
- Working solution: Colorless

Odor: Odorless

Specific Gravity (water = 1):
- Concentrate: Not available
- Working solution: > 1.00

Vapor Pressure at 20°C (68°F):
- Concentrate: Negligible
- Working solution: 24 mbar (18 mm Hg)

Vapor Density (Air = 1):
- Concentrate: Not applicable
- Working solution: 0.6

Volatile Fraction by Weight:
- Concentrate: Negligible
- Working solution: 80-85%

Boiling Point:
- Concentrate: Not applicable
- Working solution: >100°C (>212°F)

Melting Point:
- Concentrate: Not available
- Working solution: Not applicable

Solubility in Water:
  Concentrate: Appreciable
  Working solution: Complete
pH:
  Concentrate: Not applicable
  Working solution: 4.2-4.6
Flash Point:
  Concentrate: Not applicable, combustible solid
  Working solution: None

---

10. STABILITY AND REACTIVITY

Stability: Stable

Incompatibility:

Concentrate: Strong oxidizing agents, strong acids, bases, sodium hypochlorite (bleach), combustible material, halogenated materials, aqueous ammonia

Working solution: Strong oxidizing agents, strong acids, bases, sodium hypochlorite (bleach)

Hazardous Decomposition Products: Ammonia, chloramine

Hazardous Polymerization: Will not occur.

---

11. TOXICOLOGICAL INFORMATION

Effects of Exposure:

Inhalation:

Concentrate: May cause irritation to the mucous membranes and upper respiratory tract. May be harmful if inhaled. In contact with strong acids or if heated, sulfites may liberate sulfur dioxide gas. Sulfur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Working solution: Expected to be a low hazard for usual industrial or commercial handling by trained personnel. In contact with strong acids or if heated, sulfites may liberate sulfur dioxide gas. Sulfur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes:

Concentrate: Causes irritation.

Working solution: Expected to be a low hazard for usual industrial or commercial handling by trained personnel.

Skin: This material has a low potential to cause allergic skin reactions; however, cases of human skin sensitization have been reported.

Ingestion:

Concentrate: May be harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea. May cause irritation of the gastrointestinal tract if swallowed.

Working solution: May be harmful if swallowed. Some asthmatics or

sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

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12. ECOLOGICAL INFORMATION

Introduction: This environmental effects summary is written to assist in addressing emergencies created by an accidental spill which might occur during the shipment of this material, and, in general, it is not meant to address discharges to sanitary sewers or publically owned treatment works.

Summary: Data for the major components of this material have been used to estimate the environmental impact of this material. This material forms a moderately acidic aqueous solution, and this property may cause adverse environmental effects. However, this material, itself, has not been tested for environmental effects.

It is expected to have the following properties: a moderate biochemical oxygen demand and may cause oxygen depletion in aqueous systems, a low potential to affect aquatic organisms, a low potential to affect secondary waste treatment microbial metabolism, a low potential to affect the germination and/or early growth of some plants, a low potential to persist in the environment, a low potential to bioconcentrate. After dilution with a large amount of water, followed by secondary waste treatment, this material is not expected to cause adverse environmental effects.

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13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Flush to sewer with large amounts of water.

Concentrate: Since emptied containers retain product residue, follow label warnings even after container is emptied.

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14. TRANSPORT INFORMATION
For transportation information regarding this product call the Kodak Worldwide Transportation Hazmat Hot Line: (716) 722-2400 between 8 a.m. and 5 p.m. (Eastern Standard Time), Monday through Friday.

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15. REGULATORY INFORMATION

- Material(s) known to the State of California to cause cancer: None
- Material(s) known to the State of California to cause adverse reproductive effects: None

Carcinogenicity Classification (components present at 0.1% or more):
- International Agency for Research on Cancer (IARC): None
- American Conference of Governmental Industrial Hygienists (ACGIH): None
- National Toxicology Program (NTP): None
- Occupational Safety and Health Administration (OSHA): None

- Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372: None

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16. OTHER INFORMATION

US/Canadian Label Statements:

Concentrate:

CONTAINS: Sodium metabisulfite (007681-57-4)

WARNING!
REDUCING AGENT
MAY BE HARMFUL IF INHALED OR SWALLOWED
MAY LIBERATE SULFUR DIOXIDE
DUST IRRITATING TO RESPIRATORY TRACT
CAUSES EYE IRRITATION

Keep container tightly closed.
Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly.
Avoid breathing dust.
Avoid contact with eyes and prolonged or repeated contact with skin.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, seek medical advice. Never give anything by mouth to an unconscious person. If inhaled, move to fresh air. Treat symptomatically. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if symptoms occur.

Keep out of reach of children.

For additional information, see Material Safety Data Sheet (MSDS) for this material.

Additional hazard precautions for containers greater than 1 gallon of liquid or 5 pounds of solid:

POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES

Minimize dust generation and accumulation.

IN CASE OF FIRE: Flood with water.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

Working solution:

CONTAINS: Sodium bisulfite (007631-90-5)

WARNING!
MAY BE HARMFUL IF INHALED OR SWALLOWED

Avoid contact with eyes and prolonged or repeated contact with skin.
Avoid breathing mist or vapor.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, seek medical advice. Never give anything by mouth to an unconscious person.

Keep out of reach of children.

For additional information, see Material Safety Data Sheet (MSDS) for this material.

Additional hazard precautions for containers greater than 1 gallon of liquid or 5 pounds of solid:

IN CASE OF FIRE: Use water spray, carbon dioxide (CO_2), dry chemical, alcohol foam.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

R-1, S-1, F-1, C-1
WS:R-1, S-1, F-1, C-0

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MATERIAL SAFETY DATA SHEET

200000591/F/USA
Approval Date: 03/04/1998
Print Date: 04/29/2000

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KODAK Rapid Fixer

Catalog Number(s): 146 4106 - To Make 1 gallon (U.S.)
146 4114 - To Make 5 gallons (U.S.)
197 3247 - 5 gallons (U.S.) - Part A
128 2839 - 30 gallons (U.S.) - Part A
186 6342 - 52 gallons (U.S.) - Part A
173 3013 - 72 ounce(s) - Part B
197 3221 - 5 gallons (U.S.) - Part B

Manufacturer/Supplier: EASTMAN KODAK COMPANY, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (716) 722-5151

For other information or to request an MSDS, call (800) 242-2424.

Synonym(s): Part A: KAN 427810, PCD 4896, D-0018.000
Part B: CIN 10066362, KAN 365686, PCD 4415, PCD 14817, D-0019.000
Working solution (film): KAN 471329, D-0018.100
Working solution (paper): KAN 471330, D-0019.100

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight % - Component - (CAS Registry No.)

Part A:

40-45	Water (007732-18-5)
40-45	Ammonium thiosulfate (007783-18-8)
5-10	Sodium acetate (000127-09-3)
1-5	Boric acid (010043-35-3)
1-5	Ammonium sulfite (010196-04-0)
1-5	Acetic acid (000064-19-7)
< 1	Sodium bisulfite (007631-90-5)

Part B:

70-75	Water (007732-18-5)
15-20	Aluminum sulfate (010043-01-3)
10-15	Sulfuric acid (007664-93-9)

Working solution (film):

80-85	Water (007732-18-5)
10-15	Ammonium thiosulfate (007783-18-8)
1-5	Sodium acetate (000127-09-3)
< 1	Boric acid (010043-35-3)
< 1	Ammonium sulfite (010196-04-0)
< 1	Acetic acid (000064-19-7)

Working solution (paper):

90-95	Water (007732-18-5)
5-10	Ammonium thiosulfate (007783-18-8)
1-5	Sodium acetate (000127-09-3)
< 1	Boric acid (010043-35-3)
< 1	Ammonium sulfite (010196-04-0)
< 1	Acetic acid (000064-19-7)

---

3. HAZARDS IDENTIFICATION

Part A:

CONTAINS: Boric acid (010043-35-3); ammonium sulfite (010196-04-0); acetic acid (000064-19-7); sodium bisulfite (007631-90-5)
WARNING!
MAY BE HARMFUL IF SWALLOWED
MAY BE HARMFUL IF ABSORBED THROUGH SKIN

HMIS Hazard Ratings:
Health - 1 , Flammability - 0, Reactivity - 0, Personal Protection - B

NFPA Hazard Ratings:
Health - 1, Flammability - 0, Reactivity (Stability) - 0

Part B:

CONTAINS: Sulfuric acid (007664-93-9)
DANGER!
POISON
MAY BE FATAL OR HARMFUL IF SWALLOWED
CAUSES SKIN AND EYE IRRITATION

HMIS Hazard Ratings:
Health - 2 , Flammability - 0, Reactivity - 0, Personal Protection - C

NFPA Hazard Ratings:
Health - 2, Flammability - 0, Reactivity (Stability) - 0

Working solution (film):

CONTAINS: Ammonium sulfite (010196-04-0)
WARNING!
MAY BE HARMFUL IF SWALLOWED

HMIS Hazard Ratings:
Health - 1 , Flammability - 0, Reactivity - 0, Personal Protection - A
NFPA Hazard Ratings:
Health - 1, Flammability - 0, Reactivity (Stability) - 0

Working solution (paper):

CONTAINS: Ammonium sulfite (010196-04-0)
WARNING!
MAY BE HARMFUL IF SWALLOWED

HMIS Hazard Ratings:
Health - 1 , Flammability - 0, Reactivity - 0, Personal Protection - A

NFPA Hazard Ratings:
Health - 0, Flammability - 0, Reactivity (Stability) - 0

NOTE: HMIS and NFPA hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. The personal protection index is only intended for general guidance on personal protection equipment (PPE) that is suitable for the potential hazards of the material. PPE (e.g., respirators) may not be needed if engineering controls (e.g., local ventilation) are adequate. An asterisk (*), in the HMIS health field, designates potential chronic or target organ hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

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4. FIRST-AID MEASURES

Inhalation: If symptomatic, move to fresh air. Treat symptomatically. Get medical attention if symptoms occur.

Eyes:

Part A & Working solution: Any material that contacts the eye should be washed out immediately with water. Get medical attention if symptoms occur.

Part B: Immediately flush with plenty of water for at least 15 minutes. Get medical attention.

Skin:

Part A & Working solution: Wash with soap and water. Get medical attention if symptoms occur.

Part B: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Ingestion:

Part A: Only induce vomiting at the instruction of medical personnel. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person.

Part B: Do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

Working solution: Drink 1-2 glasses of water. Seek medical attention. Never give anything by mouth to an unconscious person.

---

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use appropriate agent for adjacent fire.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products: None (noncombustible) (see also Hazardous Decomposition Products section)

Unusual Fire and Explosion Hazards: None

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6. ACCIDENTAL RELEASE MEASURES

May require neutralization if pH < 2.0 or > 12.5. Flush to sewer with large amounts of water. Otherwise, absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

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7. HANDLING AND STORAGE

Personal Precautionary Measures:

Part A: Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Part B: Avoid breathing mist at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Working solution: Avoid breathing mist or vapor. Avoid contact with eyes and prolonged or repeated contact with skin. Use with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion:

Part A & Working solution: Keep from contact with oxidizing materials.

Part B: No special precautionary measures should be needed under anticipated conditions of use.

Storage: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section).

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:

ACGIH Threshold Limit Value (TLV):

Acetic acid: 10 ppm TWA; 15 ppm STEL
Aluminum sulfate: 2 mg/m3 TWA, as Al soluble salts
Sulfuric acid: 1 mg/m3 TWA; 3 mg/m3 STEL
Sodium bisulfite: 5 mg/m3 TWA

OSHA (USA) Permissible Exposure Limit (PEL - 1971 Table Z-1 Values):

Acetic acid: 10 ppm TWA
Sulfuric acid: 1 mg/m3 TWA

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances such as poorly ventilated spaces, evaporation from large surfaces, spraying, heating, etc.

Respiratory Protection:

Part A & Working solution: None should be needed. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: Full-face positive-pressure air-supplied. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

Part B: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: Full-face cartridge respirator; acid gas with dust/mist prefilter. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 29 CFR 1910.134.

Eye Protection: Wear safety glasses with side shields (or goggles).
Skin Protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

Recommended Decontamination Facilities: Eye bath, washing facilities, safety shower

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9. PHYSICAL AND CHEMICAL PROPERTIES

	Part A	Part B	Working solution (film)	Working solution (paper)
Physical Form:	liquid	liquid	liquid	liquid
Color:	light yellow	colorless	colorless	colorless
Odor:	slight sulfur dioxide, acetic acid	slight sulfur dioxide	slight sulfur dioxide	slight sulfur dioxide
Specific Gravity (water	1.32	1.30	1.09	1.04

= 1):				
Vapor Pressure at 20°C (68°F):	24 mbar (18 mm Hg)	24 mbar (18 mm Hg)	24 mbar (18 mm Hg)	24 mbar (18 mm Hg)
Vapor Density (Air = 1):	0.6	0.6	0.6	0.6
Volatile Fraction by Weight:	40-45%	70-75%	80-85%	90-95%
Boiling Point:	>100°C (>212°F)	>100°C (>212°F)	>100°C (>212°F)	>100°C (>212°F)
Solubility in Water:	complete	complete	complete	complete
pH:	5.0	1.0	4.4	4.4
Flash Point:	none, noncombustible liquid	none, noncombustible liquid	none, noncombustible liquid	none, noncombustible liquid

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10. STABILITY AND REACTIVITY

Stability: Stable

Incompatibility:

Part A: Bases, sodium hypochlorite (bleach), strong oxidizing agents, strong acids. Contact with base liberates flammable material.

Part B: Bases

Working solution: Bases, sodium hypochlorite (bleach), strong oxidizing agents, strong acids.

Hazardous Decomposition Products:

Part A: Ammonia, nitrogen oxides (NOx), sulfur dioxide, chloramine, carbon dioxide, carbon monoxide

Part B: Sulfur dioxide

Working solution: Ammonia, nitrogen oxides (NOx), sulfur dioxide, chloramine

Hazardous Polymerization: Will not occur.

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11. TOXICOLOGICAL INFORMATION

Effects of Exposure:

General:

Part A: Contains: boric acid. Based on repeated-dose ingestion studies in animals, may cause adverse reproductive and developmental effects. However, the doses administered were many times those to which humans would normally be exposed.

Part B: Contains: sulfuric acid. International Agency for Research on Cancer (IARC) has determined that occupational exposure to strong inorganic mists or vapors containing sulfuric acid is carcinogenic to humans. This product is not expected to generate mists or vapors when product instructions for mixing and use are followed.

Inhalation:

Part A & Working solution: Expected to be a low hazard for recommended handling. In contact with strong acids or if heated, sulfites may liberate sulfur dioxide gas. Sulfur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Part B: Expected to be a low hazard for recommended handling.

Eyes:

Part A & Working solution: No specific hazard known. May cause transient irritation.

Part B: Causes irritation.

Skin:

Part A: May be absorbed in toxic amounts through damaged or abraded skin. This material has a low potential to cause allergic skin reactions; however, cases of human skin sensitization have been reported.

Part B: Causes irritation.

Working solution: This material has a low potential to cause allergic skin reactions; however, cases of human skin sensitization have been reported.

Ingestion:

Part A & Working solution: May be harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

Part B: May be fatal or harmful if swallowed. May cause burns of the gastrointestinal tract if swallowed.

Acute Toxicity Data:

Data for Part A

Oral LD-50 (rat): > 2540 mg/kg
Dermal LD-50: > 20 mL/kg

Skin irritation: slight
Eye irritation: slight

Data for Part B

Oral LD-50 (rat): 0.5-5.0 g/kg
Skin irritation: moderate
Eye irritation: slight
Skin sensitization: negative

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12. ECOLOGICAL INFORMATION

Introduction: This environmental effects summary is written to assist in addressing emergencies created by an accidental spill which might occur during the shipment of this material, and, in general, it is not meant to address discharges to sanitary sewers or publically owned treatment works.

Summary: Data for the major components of this material have been used to estimate the environmental impact of this material. However, this material, itself, has not been tested for environmental effects.

Part A:

This material is a moderately acidic aqueous solution, and this property may cause adverse environmental effects. It is expected to have the following properties: a high biochemical oxygen demand and a potential to cause oxygen depletion in aqueous systems, a low potential to affect aquatic organisms, a low potential to affect secondary waste treatment microbial metabolism, a high potential to affect the growth of some plant seedlings, a low potential to persist in the environment, a low potential to bioconcentrate. After dilution with a large amount of water, followed by secondary waste treatment, this material is not expected to cause adverse environmental effects.

Part B:

This material is a strongly acidic aqueous solution, and this property may cause adverse environmental effects. It is expected to have the following properties: no biochemical oxygen demand and no potential to cause oxygen depletion in aqueous systems, a high potential to affect some aquatic organisms, a low potential to affect secondary waste treatment microbial metabolism, a low potential to affect the germination and/or early growth of some plants, a low potential to bioconcentrate. After dilution with a large amount of water, followed by secondary waste treatment, this material is not expected to cause adverse environmental effects.

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13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. May require neutralization if pH < 2.0 or pH > 12.5. Flush to sewer with large amounts of water.

Part B: Since emptied containers retain product residue, follow label warnings even after container is emptied.

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14. TRANSPORT INFORMATION

For transportation information regarding this product call the Kodak Worldwide Transportation Hazmat Hot Line: (716) 722-2400 between 8 a.m. and 5 p.m. (Eastern Standard Time), Monday through Friday.

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15. REGULATORY INFORMATION

Material(s) known to the State of California to cause cancer: None
Material(s) known to the State of California to cause adverse reproductive effects: None

Carcinogenicity Classification (components present at 0.1% or more):
International Agency for Research on Cancer (IARC): Group 1A, Strong inorganic mists or vapors containing sulfuric acid
American Conference of Governmental Industrial Hygienists (ACGIH): Sulfuric acid (A2)
National Toxicology Program (NTP): None
Occupational Safety and Health Administration (OSHA): None

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372: None

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16. OTHER INFORMATION

US/Canadian Label Statements:

Part A:

WARNING! CONTAINS: Boric acid (010043-35-3); ammonium sulfite (010196-04-0); acetic acid (000064-19-7); sodium bisulfite (007631-90-5)
MAY BE HARMFUL IF SWALLOWED
MAY BE HARMFUL IF ABSORBED THROUGH SKIN

Avoid breathing mist or vapor.
Avoid contact with eyes, skin, and clothing.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, only induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. In case of skin contact, wash skin with soap and plenty of water. Get medical attention if symptoms occur.

Keep out of reach of children.
For additional information, see Material Safety Data Sheet (MSDS) for this material.

Part B:

CONTAINS: Sulfuric acid (007664-93-9)
DANGER! POISON
MAY BE FATAL OR HARMFUL IF SWALLOWED
CAUSES SKIN AND EYE IRRITATION

Avoid breathing mist.
Use with adequate ventilation.
Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.

FIRST AID: If swallowed, do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. In case of contact, immediately flush eyes and skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

Keep out of reach of children.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood.

Working solution:

CONTAINS: Ammonium sulfite (010196-04-0)
WARNING!
MAY BE HARMFUL IF SWALLOWED

Avoid breathing mist or vapor.
Avoid contact with eyes and prolonged or repeated contact with skin.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, seek medical advice. Never give anything by mouth to an unconscious person. Get medical attention if symptoms occur.

Keep out of reach of children.

For additional information, see Material Safety Data Sheet (MSDS) for this material.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

A:R-1, S-2, F-0, C-0
B:R-1, S-2, F-0, C-0

WS:R-1, S-1, F-0, C-0 - Working solution (film)
WS:R-1, S-1, F-0, C-0 - Working solution (paper)

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Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product name: KODAK DEKTOL Developer (Single Powder)

Product code: 1464734

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For further information about this product, call (800) 242-2424.

Synonyms: PCD 224

Product Use: photographic processing chemical (developer/activator), For industrial use only.

2. Hazards identification

CONTAINS: Sodium carbonate, monohydrate (5968-11-6), Sodium sulphite (7757-83-7), Hydroquinone (123-31-9), Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0), Polyphosphoric acids, sodium salts (68915-31-1), Potassium bromide (7758-02-3)

WARNING!
MAY LIBERATE SULFUR DIOXIDE
HARMFUL IF INHALED OR SWALLOWED
CAUSES SKIN AND EYE IRRITATION
DUST IRRITATING TO THE EYES AND RESPIRATORY TRACT
MAY CAUSE ALLERGIC SKIN REACTION
REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY
MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA
MAY CAUSE KIDNEY DAMAGE BASED ON ANIMAL DATA
MAY CAUSE CYANOSIS BASED ON ANIMAL DATA

HMIS III Hazard Ratings: Health - 2*, Flammability - 0, Physical Hazard - 0

NFPA Hazard Ratings: Health - 3, Flammability - 0, Instability - 0

NOTE: HMIS III and NFPA 704 (2007) hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight percent	Components - (CAS-No.)
50 - 55	Sodium carbonate, monohydrate (5968-11-6)
30 - 35	Sodium sulphite (7757-83-7)
5 - 10	Hydroquinone (123-31-9)

1 - 5	Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0)
1 - 5	Polyphosphoric acids, sodium salts (68915-31-1)
1 - 5	Potassium bromide (7758-02-3)

4. First aid measures

Inhalation: If inhaled, remove to fresh air. Get medical attention.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

Skin: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately.

Notes to physician:

Treatment: Absorption of this material into the body leads to the formation of methemoglobin that, in sufficient concentration, causes cyanosis. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of the entire contaminated area of the body, including scalp and nails, is of utmost importance. If cyanosis is severe, intravenous injection of methylene blue, one milligram per kilogram of body weight, may be of value.

5. Fire-fighting measures

Extinguishing Media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products: None (noncombustible), (see also Hazardous Decomposition Products sections.)

Unusual Fire and Explosion Hazards: None.

6. Accidental release measures

Shovel into suitable container for disposal. Avoid dust formation. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Do not breathe dust at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion: No special technical protective measures required.

Storage: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls/personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Hydroquinone	ACGIH	time weighted average	1 mg/m3
	OSHA	time weighted average	2 mg/m3
Sulphur dioxide	ACGIH	Short term exposure limit	0.25 ppm
	OSHA	time weighted average	5 ppm 13 mg/m3

Ventilation: Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. Controls should be sufficient so that applicable occupational exposure limits are not exceeded.

Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: N95 Particulate Filter. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: acid gas See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

9. Physical and chemical properties

Physical form: solid (powder)

Colour: white

Odour: odourless

Specific gravity: no data available

Vapour pressure (at 20.0 °C (68.0 °F)) : negligible

Vapour density: not applicable

Boiling point/boiling range: not applicable

Melting point/range: no data available

Water solubility: appreciable

pH: not applicable

Flash point: not applicable

10. Stability and reactivity

Stability: Stable under normal conditions.

Incompatibility: Acids. Contact with strong acids liberates sulphur dioxide.

Hazardous decomposition products: Sulphur oxides

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Hydroquinone. There is insufficient evidence for classifying hydroquinone as a suspected carcinogenic or mutagenic substance in humans. No increases in cancer rates were observed in an epidemiology study which looked at mortality among more than 800 persons employed primarily in the manufacture of hydroquinone. Carcinogenicity studies in animals were inconclusive. Rats and mice were given hydroquinone by stomach tube or at high concentrations in the diet. Responses were not consistent across route of exposure, species or sex. The International Agency for Research on Cancer (IARC) has classified hydroquinone in Group 3, i.e., "not classifiable" as a carcinogen. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome breakage) of hydroquinone in vivo and in vitro. The relevance of chromosomal effects in test animals in predicting human risk is unclear.

Contains: Bis(4-hydroxy-N-methylanilinium) sulphate. Based on animal data, may cause adverse effects on the following organs/systems: blood, kidney, spleen. Based on animal data this material can produce methemoglobin which, in sufficient concentration, causes cyanosis, a blue-gray discoloration of the skin and lips caused by a reduced ability of the blood to carry oxygen.

Contains: Polyphosphoric acids, sodium salts. May cause kidney damage based on animal data.

Contains: Potassium bromide. Ingestion of bromide salts can cause nausea, vomiting, headache, irritability, delirium, memory loss, decreased appetite, joint pain, hallucinations, stupor, coma, and acne like rash on face, legs, and trunk.

Inhalation: Harmful if inhaled. Airborne dust irritating. May cause irritation to the mucous membranes and upper respiratory tract. In contact with strong acids or if heated, sulphites may

liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes: Causes eye irritation. Airborne dust irritating. Repeated exposure to dust may cause eye injury.

Skin: Causes skin irritation. May cause allergic skin reaction based on human experience. May cause skin depigmentation.

Ingestion: Harmful if swallowed. May cause irritation of the gastrointestinal tract. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

Acute Toxicity Data:
Oral LD50 (rat): 500 - 5,000 mg/kg

- Skin irritation: moderate

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	1 - 10 mg/l
Toxicity to daphnia (EC50):	Daphnia: 1 - 10 mg/l
Persistence and degradability:	Not readily biodegradable.

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

The information given below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions. Please consult the product packaging for further details.

IATA:	UN number:	UN3077	
	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (hydroquinone, Bis(4-hydroxy-N-methylanilinium) sulphate)	
	Class:	9	
	Packaging group:	III	
	Marine Pollutant status:	Marine pollutant	
	Marine Pollutant(s):	hydroquinone, sulphate	Bis(4-hydroxy-N-methylanilinium)

IMDG:	UN number:	UN3077
	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (hydroquinone, Bis(4-hydroxy-N-methylanilinium) sulphate)
	Class:	9
	Packaging group:	III
	Marine Pollutant status:	Marine pollutant
	Marine Pollutant(s):	hydroquinone, Bis(4-hydroxy-N-methylanilinium) sulphate
US DOT:	UN number:	UN3077
	Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (hydroquinone, Bis(4-hydroxy-N-methylanilinium) sulphate)
	Class:	9
	Packaging group:	III
	Marine Pollutant status:	Marine pollutant
	Marine Pollutant(s):	hydroquinone, Bis(4-hydroxy-N-methylanilinium) sulphate

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
TSCA	Not all listed
DSL	Not all listed
NDSL	None listed
EINECS	Not all listed
ELINCS	None listed
NLP	None listed
AICS	All listed
IECS	All listed
ENCS	All listed
ECI	Not all listed
NZIoC	All listed
PICCS	All listed

"Not all listed" indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans: Hydroquinone
International Agency for Research on Cancer (IARC):	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
U.S. National Toxicology Program (NTP):	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
U.S. Occupational Safety and Health Administration (OSHA):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
California Prop. 65	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
U.S. - CERCLA/SARA (40 CFR § 302.4 Designation of hazardous substances):	Hydroquinone
U.S. - CERCLA/SARA - Section 302 (40 CFR § 355 Appendices A and B - The List of Extremely Hazardous Substances and Their Threshold Planning Quantities):	Hydroquinone
U.S. - CERCLA/SARA - Section 313 (40 CFR § 372.65 Toxic Chemical Release Reporting):	Hydroquinone
U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances:	Hydroquinone
U.S. - California - 8 CCR Section 5200-5220 - Specifically Regulated Carcinogens:	No components found on the California Specifically Regulated Carcinogens List.
U.S. - California - 8 CCR Section 5203 Carcinogens:	No components found on the California Section 5203 Carcinogens List.
U.S. - California - 8 CCR Section 5209 Carcinogens:	No components found on the California Section 5209 Carcinogens List.
U.S. - Massachusetts - General Law Chapter 111F (MGL c 111F) - Hazardous Substances Disclosure by Employers (a.k.a. Right to Know Law):	Hydroquinone
U.S. - Minnesota Employee Right-to-Know (5206.0400, Subpart 5. List of Hazardous Substances):	Hydroquinone
U.S. - New Jersey - Worker and Community Right to Know Act (N.J.S.A. 34:5A-1):	Hydroquinone
U.S. - Pennsylvania - Part XIII. Worker and Community	Sodium carbonate, monohydrate,

Right-to-Know Act (Chapter 323 Hazardous Substance List, Appendix A):	Sodium sulphite, Hydroquinone

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

KODAK DEKTOL Developer (Single Powder)
CONTAINS: Sodium carbonate, monohydrate (5968-11-6), Sodium sulphite (7757-83-7), Hydroquinone (123-31-9), Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0), Polyphosphoric acids, sodium salts (68915-31-1), Potassium bromide (7758-02-3).
WARNING! MAY LIBERATE SULFUR DIOXIDE. HARMFUL IF INHALED OR SWALLOWED. CAUSES SKIN AND EYE IRRITATION. DUST IRRITATING TO THE EYES AND RESPIRATORY TRACT. MAY CAUSE ALLERGIC SKIN REACTION. REPEATED EXPOSURE TO DUST MAY CAUSE EYE INJURY. MAY CAUSE BLOOD DISORDERS BASED ON ANIMAL DATA. MAY CAUSE KIDNEY DAMAGE BASED ON ANIMAL DATA. MAY CAUSE CYANOSIS BASED ON ANIMAL DATA.
Do not breathe dust at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after handling. **FIRST AID:** If inhaled, remove to fresh air. Get medical attention. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately. **Note to Physicians:** Absorption of this material into the body leads to the formation of methemoglobin that, in sufficient concentration, causes cyanosis. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of the entire contaminated area of the body, including scalp and nails, is of utmost importance. If cyanosis is severe, intravenous injection of methylene blue, one milligram per kilogram of body weight, may be of value. Keep out of reach of children. Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood. Since emptied containers retain product residue, follow label warnings even after container is emptied. **IN CASE OF FIRE:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. **IN CASE OF SPILL:** Shovel into suitable container for disposal. Avoid dust formation. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-2, S-2, F-0, C-0

Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product name: KODAK DEKTOL Developer (Single Powder), Working Solution

Product code: 1464734 - Working Solution

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For further information about this product, call (800) 242-2424.

Synonyms: None.

Product Use: photographic processing chemical (developer/activator), For industrial use only.

2. Hazards identification

CONTAINS: Sodium sulphite (7757-83-7), Hydroquinone (123-31-9), Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0)

WARNING!
MAY LIBERATE SULFUR DIOXIDE
MAY BE HARMFUL IF SWALLOWED
CAUSES SKIN AND EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION

HMIS III Hazard Ratings: Health - 2, Flammability - 0, Reactivity (Stability) - 0

NFPA Hazard Ratings: Health - 3, Flammability - 0, Instability - 0

NOTE: HMIS III and NFPA 704 (2007) hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight percent	Components - (CAS-No.)
1 - 5	Sodium sulphite (7757-83-7)
0.1 - < 1	Hydroquinone (123-31-9)
0.1 - < 1	Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0)

4. First aid measures

Inhalation: If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, DO NOT induce vomiting. Call a physician or poison control centre immediately. Never give anything by mouth to an unconscious person.

5. Fire-fighting measures

Extinguishing Media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special Fire-Fighting Procedures: None (noncombustible)

Hazardous Combustion Products: None (noncombustible)

Unusual Fire and Explosion Hazards: None.

6. Accidental release measures

Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Avoid breathing mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion: No special technical protective measures required.

Storage: Keep container tightly closed.

8. Exposure controls/personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Hydroquinone	ACGIH	time weighted average	1 mg/m3
	OSHA	time weighted average	2 mg/m3
Sulphur dioxide	ACGIH	Short term exposure limit	0.25 ppm
	OSHA	time weighted average	5 ppm 13 mg/m3

Ventilation: Good general ventilation should be used. Ventilation should be sufficient so that applicable occupational exposure limits are not exceeded. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances.

Respiratory protection: None should be needed. If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

9. Physical and chemical properties

Physical form: liquid

Colour: light yellow

Odour: odourless

Specific gravity: 1.04 - 1.06

Vapour pressure: 24 mbar (18.0 mm Hg)

Vapour density: 0.6

Volatile fraction by weight: 90 - 95 %

Boiling point/boiling range: > 100 °C (> 212.0 °F)

Melting point/range: not applicable

Water solubility: complete

pH: 10.2 - 10.4

Flash point: does not flash

10. Stability and reactivity

Stability: Stable under normal conditions.

Incompatibility: Acids. Contact with strong acids liberates sulphur dioxide.

Hazardous decomposition products: Sulphur oxides

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Hydroquinone. There is insufficient evidence for classifying hydroquinone as a suspected carcinogenic or mutagenic substance in humans. No increases in cancer rates were observed in an epidemiology study which looked at mortality among more than 800 persons employed primarily in the manufacture of hydroquinone. Carcinogenicity studies in animals were inconclusive. Rats and mice were given hydroquinone by stomach tube or at high concentrations in the diet. Responses were not consistent across route of exposure, species or sex. The International Agency for Research on Cancer (IARC) has classified hydroquinone in Group 3, i.e., "not classifiable" as a carcinogen. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome breakage) of hydroquinone in vivo and in vitro. The relevance of chromosomal effects in test animals in predicting human risk is unclear.

Contains: Bis(4-hydroxy-N-methylanilinium) sulphate. Based on animal data, may cause adverse effects on the following organs/systems: blood, kidney, spleen. Based on animal data this material can produce methemoglobin which, in sufficient concentration, causes cyanosis, a blue-gray discoloration of the skin and lips caused by a reduced ability of the blood to carry oxygen.

Inhalation: Expected to be a low hazard for recommended handling. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing. Some asthmatics or hypersensitive individuals may experience difficulty breathing.

Eyes: Causes eye irritation.

Skin: Causes skin irritation. May cause an allergic skin reaction.

Ingestion: May be harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

Data for Sodium sulphite (CAS 7757-83-7):

Acute Toxicity Data:
Oral LD50 (rat): > 1,600 mg/kg

- Inhalation LC50 (rat): > 5.5 mg/l / 4 hr
- Inhalation LC50 (rat): > 22 mg/l / 1 hr
- Skin irritation: none
- Eye irritation: slight; washing palliative

Data for Hydroquinone (CAS 123-31-9):

Acute Toxicity Data:
Oral LD50 (rat): 400 mg/kg

- Dermal LD50 (guinea pig): > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm 2 / hour
- Skin irritation: slight
- Skin Sensitization (guinea pig): positive
- Eye irritation: moderate

Mutagenicity/Genotoxicity Data:

Salmonella typhimurium assay (Ames test): negative (in presence and absence of activation)

- Chromosomal aberration assay: negative (in absence of activation)
- Chromosomal aberration assay: positive (in presence of activation)
- Sister chromatid exchange (SCE) assay: positive (in presence and absence of activation)

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Dermal (17-day, rat): NOEL; 3800 mg/kg/day
- Dermal (17-day): Lowest observable effect level; 4800 mg/kg/day

Developmental Toxicity Data:

Oral (female rabbit): NOEL for developmental toxicity; 25mg/kg/day

Data for Bis(4-hydroxy-N-methylanilinium) sulphate (CAS 55-55-0):

Acute Toxicity Data:

Oral LD50 (rat): 237 mg/kg

- Oral LD50 (mouse): 565 mg/kg
- Dermal LD50 (guinea pig): > 1,000 mg/kg (highest dose tested)
- Skin irritation: slight
- Skin irritation: slight to moderate (repeated skin application)
- Skin Sensitization: positive
- Eye irritation (unwashed eyes): moderate to strong
- Eye irritation (washed eyes): slight

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Oral (11 days): Lowest observable effect level; 1.0 % in diet (reduced feed intake, reduced body weight gain, target organ effects: red blood cell)
- Oral (11 days): NOEL; 0.1 % in diet

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	1 - 10 mg/l
Toxicity to daphnia (EC50):	1 - 10 mg/l

Persistence and degradability: Readily biodegradable.

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
TSCA	Not all listed
DSL	Not all listed
NDSL	None listed
EINECS	Not all listed
ELINCS	None listed
NLP	None listed
AICS	All listed
IECS	All listed
ENCS	All listed
ECI	Not all listed
NZIoC	All listed
PICCS	All listed

"Not all listed" indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans: Hydroquinone
International Agency for Research on Cancer (IARC):	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
U.S. National Toxicology Program (NTP):	No component of this product present

	at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
U.S. Occupational Safety and Health Administration (OSHA):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
California Prop. 65	This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
U.S. - CERCLA/SARA (40 CFR § 302.4 Designation of hazardous substances):	Hydroquinone
U.S. - CERCLA/SARA - Section 302 (40 CFR § 355 Appendices A and B - The List of Extremely Hazardous Substances and Their Threshold Planning Quantities):	Hydroquinone, Sulphur dioxide
U.S. - CERCLA/SARA - Section 313 (40 CFR § 372.65 Toxic Chemical Release Reporting):	Hydroquinone
U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances:	Sulphur dioxide
U.S. - California - 8 CCR Section 5200-5220 - Specifically Regulated Carcinogens:	No components found on the California Specifically Regulated Carcinogens List.
U.S. - California - 8 CCR Section 5203 Carcinogens:	No components found on the California Section 5203 Carcinogens List.
U.S. - California - 8 CCR Section 5209 Carcinogens:	No components found on the California Section 5209 Carcinogens List.
U.S. - Massachusetts - General Law Chapter 111F (MGL c 111F) - Hazardous Substances Disclosure by Employers (a.k.a. Right to Know Law):	Sulphur dioxide
U.S. - Minnesota Employee Right-to-Know (5206.0400, Subpart 5. List of Hazardous Substances):	Sulphur dioxide
U.S. - New Jersey - Worker and Community Right to Know Act (N.J.S.A. 34:5A-1):	Sulphur dioxide
U.S. - Pennsylvania - Part XIII. Worker and Community Right-to-Know Act (Chapters 301-323):	Hydroquinone, Sodium carbonate, monohydrate, Sulphur dioxide, Water
U.S. - Rhode Island - Title 28 Labor and Labor Relations (Chapters 28-21 Hazardous Substance Right-to-Know Act):	Sulphur dioxide

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

KODAK DEKTOL Developer (Single Powder), Working Solution
CONTAINS: Sodium sulphite (7757-83-7), Hydroquinone (123-31-9), Bis(4-hydroxy-N-methylanilinium) sulphate (55-55-0).
WARNING! MAY LIBERATE SULFUR DIOXIDE. MAY BE HARMFUL IF SWALLOWED. CAUSES SKIN AND EYE IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
Avoid breathing mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling. **FIRST AID:** If inhaled, remove to fresh air. Get medical attention if symptoms occur. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention. Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, DO NOT induce vomiting. Call a physician or poison control centre immediately. Never give anything by mouth to an unconscious person. Keep out of reach of children. Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood. Since emptied containers retain product residue, follow label warnings even after container is emptied. **IN CASE OF FIRE:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. **IN CASE OF SPILL:** Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-1, S-2, F-0, C-0

Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product name: KODAK Hypo Clearing Agent

Product code: 1464254

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For further information about this product, call (800) 242-2424.

Synonyms: PCD 0515

Product Use: photographic processing chemical, For industrial use only.

2. Hazards identification

CONTAINS: Sodium sulphite (7757-83-7), Sodium metabisulphite (7681-57-4)

WARNING!
CAN DECOMPOSE AT ELEVATED TEMPERATURES
MAY LIBERATE SULFUR DIOXIDE
MAY BE HARMFUL IF INHALED OR SWALLOWED
MAY CAUSE EYE IRRITATION
THE PHYSICAL-CHEMICAL PROPERTIES OF THIS MATERIAL HAVE NOT BEEN FULLY INVESTIGATED

HMIS III Hazard Ratings: Health - 2, Flammability - 0, Physical Hazard - 1

NFPA Hazard Ratings: Health - 3, Flammability - 0, Instability - 1

NOTE: HMIS III and NFPA 704 (2007) hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight percent	Components - (CAS-No.)
75 - 80	Sodium sulphite (7757-83-7)
15 - 20	Sodium metabisulphite (7681-57-4)
1 - 5	Sodium citrate (6132-04-3)
1 - 5	Ethylenediaminetetraacetic acid tetrasodium salt (64-02-8)

4. First aid measures

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms occur.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

Skin: Wash off with soap and water. Get medical attention if symptoms occur.

Ingestion: If swallowed, DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately.

5. Fire-fighting measures

Extinguishing Media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products: None (noncombustible), (see also Hazardous Decomposition Products sections.)

Unusual Fire and Explosion Hazards: Fire or high temperatures may cause decomposition.

6. Accidental release measures

Shovel into suitable container for disposal. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Avoid breathing dust at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling. Do not eat, drink or smoke when using this product.

Prevention of Fire and Explosion: Keep away from heat and sources of ignition.

Storage: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls/personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Sodium metabisulphite	ACGIH	time weighted average	5 mg/m3
Sulphur dioxide		Short term exposure limit	0.25 ppm
	OSHA	time weighted average	5 ppm 13 mg/m3

Ventilation: Good general ventilation should be used. Ventilation should be sufficient so that applicable occupational exposure limits are not exceeded. Ventilation rates should be matched to conditions.

Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances.

Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: N95 Particulate Filter. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: acid gas See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: For operations where prolonged or repeated skin contact may occur, impervious gloves should be worn.

9. Physical and chemical properties

Physical form: solid (powder or granules)

Colour: white

Odour: odourless

Specific gravity: > 1

Vapour pressure: not applicable

Vapour density: not applicable

Melting point/range: no data available

Water solubility: appreciable

pH: not applicable

Flash point: not applicable

10. Stability and reactivity

Stability: Not fully evaluated. Materials containing similar structural groups can decompose if heated.

Incompatibility: Acids, Strong oxidizing agents. Contact with strong acids liberates sulphur dioxide.

Hazardous decomposition products: sulphur dioxide

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Sodium metabisulphite. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Inhalation: May be harmful if inhaled. May cause irritation to the mucous membranes and upper respiratory tract. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes: May cause eye irritation.

Skin: Prolonged or repeated skin contact may cause irritation. This material has a low potential to cause allergic skin reactions; however, cases of human skin sensitization have been reported.

Ingestion: May be harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea. May cause irritation of the gastrointestinal tract.

Acute Toxicity Data:
Oral LD50 (rat): > 1,600 mg/kg

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	> 100 mg/l
Toxicity to daphnia (EC50):	> 100 mg/l
Toxicity to algae (IC50):	> 100 mg/l
Toxicity to other organisms:	> 100 mg/l
Persistence and degradability:	Readily biodegradable.
Chemical Oxygen Demand (COD):	ca. 150 g/l
Biochemical Oxygen Demand (BOD):	ca. 135 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
TSCA	Not all listed
DSL	Not all listed
NDSL	None listed
EINECS	Not all listed
ELINCS	None listed
NLP	None listed
AICS	All listed
IECS	All listed
ENCS	All listed
ECI	Not all listed
NZIoC	All listed
PICCS	All listed

"Not all listed" indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
International Agency for Research on Cancer (IARC):	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
U.S. National Toxicology Program (NTP):	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
U.S. Occupational Safety and Health Administration (OSHA):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

California Prop. 65	WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
U.S. - CERCLA/SARA (40 CFR § 302.4 Designation of hazardous substances):	No components of this product are subject to the SARA Section 302 (40 CFR 302.4) reporting requirements.
U.S. - CERCLA/SARA - Section 302 (40 CFR § 355 Appendices A and B - The List of Extremely Hazardous Substances and Their Threshold Planning Quantities):	No components of this product are subject to the SARA Section 302 (40 CFR 355) reporting requirements.
U.S. - CERCLA/SARA - Section 313 (40 CFR § 372.65 Toxic Chemical Release Reporting):	No components of this product are subject to the SARA Section 313 (40 CFR 372.65) reporting requirements.
U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances:	Sodium metabisulphite
U.S. - California - 8 CCR Section 5200-5220 - Specifically Regulated Carcinogens:	No components found on the California Specifically Regulated Carcinogens List.
U.S. - California - 8 CCR Section 5203 Carcinogens:	No components found on the California Section 5203 Carcinogens List.
U.S. - California - 8 CCR Section 5209 Carcinogens:	No components found on the California Section 5209 Carcinogens List.
U.S. - Massachusetts - General Law Chapter 111F (MGL c 111F) - Hazardous Substances Disclosure by Employers (a.k.a. Right to Know Law):	Sodium metabisulphite
U.S. - Minnesota Employee Right-to-Know (5206.0400, Subpart 5. List of Hazardous Substances):	Sodium metabisulphite
U.S. - New Jersey - Worker and Community Right to Know Act (N.J.S.A. 34:5A-1):	Sodium metabisulphite
U.S. - Pennsylvania - Part XIII. Worker and Community Right-to-Know Act (Chapter 323 Hazardous Substance List, Appendix A):	Sodium sulphite, Sodium metabisulphite, Sodium citrate

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

KODAK Hypo Clearing Agent
CONTAINS: Sodium sulphite (7757-83-7), Sodium metabisulphite (7681-57-4).

WARNING! CAN DECOMPOSE AT ELEVATED TEMPERATURES. MAY LIBERATE SULFUR DIOXIDE. MAY BE HARMFUL IF INHALED OR SWALLOWED. MAY CAUSE EYE IRRITATION. THE PHYSICAL-CHEMICAL PROPERTIES OF THIS MATERIAL HAVE NOT BEEN FULLY INVESTIGATED.
Avoid breathing dust at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling. **FIRST AID:** If symptomatic, move to fresh air. Get medical attention if symptoms occur. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention. Wash off with soap and water. Get medical attention if symptoms occur. If swallowed, DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately. Keep out of reach of children. Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood. Since emptied containers retain product residue, follow label warnings even after container is emptied. **IN CASE OF FIRE:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. **IN CASE OF SPILL:** Shovel into suitable container for disposal. Clean surface thoroughly to remove residual contamination. Additional Components Include: Sodium citrate (6132-04-3), Ethylenediaminetetraacetic acid tetrasodium salt (64-02-8).

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-1, S-2, F-0, C-1T

Material Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product name: KODAK Hypo Clearing Agent, Working solution

Product code: 1464254 - Working solution

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For further information about this product, call (800) 242-2424.

Synonyms: None.

Product Use: photographic processing chemical, For industrial use only.

2. Hazards identification

CONTAINS: Sodium sulphite (7757-83-7), Sodium bisulphite (7631-90-5)

WARNING!
MAY BE HARMFUL IF SWALLOWED

HMIS III Hazard Ratings: Health - 1, Flammability - 0, Reactivity (Stability) - 0

NFPA Hazard Ratings: Health - 3, Flammability - 0, Instability - 0

NOTE: HMIS III and NFPA 704 (2007) hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight percent	Components - (CAS-No.)
1 - 5	Sodium sulphite (7757-83-7)
0.1 - < 1	Sodium bisulphite (7631-90-5)

4. First aid measures

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms occur.

Eyes: Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lens, if worn. Get medical attention if symptoms occur.

Skin: Wash off with soap and water. Get medical attention if symptoms occur.

Ingestion: If swallowed, DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately.

5. Fire-fighting measures

Extinguishing Media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special Fire-Fighting Procedures: None (noncombustible)

Hazardous Combustion Products: None (noncombustible), (see also Hazardous Decomposition Products sections.)

Unusual Fire and Explosion Hazards: None.

6. Accidental release measures

Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Avoid breathing mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling. Do not eat, drink or smoke when using this product.

Prevention of Fire and Explosion: No special technical protective measures required.

Storage: Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls/personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Sulphur dioxide	ACGIH	Short term exposure limit	0.25 ppm
	OSHA	time weighted average	5 ppm 13 mg/m3

Ventilation: Good general ventilation should be used. Ventilation should be sufficient so that applicable occupational exposure limits are not exceeded. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances.

Respiratory protection: None should be needed. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: acid gas See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: For operations where prolonged or repeated skin contact may occur, impervious gloves should be worn.

9. Physical and chemical properties

Physical form: liquid

Colour: colourless

Odour: odourless

Specific gravity: 1.02

Vapour pressure (at 20.0 °C (68.0 °F)) : 24 mbar (18.0 mm Hg)

Vapour density: 0.6

Volatile fraction by weight: 95 - 100 %

Boiling point/boiling range: > 100 °C (> 212.0 °F)

Water solubility: complete

pH: 7

Flash point: does not flash

10. Stability and reactivity

Stability: Stable under normal conditions.

Incompatibility: Acids. Contact with strong acids liberates sulphur dioxide.

Hazardous decomposition products: Sulphur oxides

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

Inhalation: Expected to be a low hazard for recommended handling. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes: No specific hazard known. May cause transient irritation.

Skin: This material has a low potential to cause allergic skin reactions; however, cases of human skin sensitization have been reported.

Ingestion: May be harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

Data for Sodium sulphite (CAS 7757-83-7):

Acute Toxicity Data:
Oral LD50 (rat): > 1,600 mg/kg

- Inhalation LC50 (rat): > 5.5 mg/l / 4 hr
- Inhalation LC50 (rat): > 22 mg/l / 1 hr
- Skin irritation: none
- Eye irritation: slight; washing palliative

Data for Sodium bisulphite (CAS 7631-90-5):

Acute Toxicity Data:
Oral LD50 (rat): > 1,600 mg/kg

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	> 100 mg/l
Toxicity to daphnia (EC50):	> 100 mg/l
Toxicity to algae (IC50):	> 100 mg/l
Toxicity to other organisms:	> 100 mg/l
Persistence and degradability:	Readily biodegradable.
Chemical Oxygen Demand (COD):	ca. 5 g/l
Biochemical Oxygen Demand (BOD):	ca. 3 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
TSCA	All listed
DSL	All listed
NDSL	None listed
EINECS	All listed
ELINCS	None listed
NLP	None listed
AICS	All listed
IECS	All listed
ENCS	All listed
ECI	All listed
NZIoC	All listed
PICCS	All listed

"Not all listed" indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
International Agency for Research on Cancer (IARC):	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
U.S. National Toxicology Program (NTP):	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
U.S. Occupational Safety and Health Administration (OSHA):	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
California Prop. 65	This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

U.S. - CERCLA/SARA (40 CFR § 302.4 Designation of hazardous substances):	No components of this product are subject to the SARA Section 302 (40 CFR 302.4) reporting requirements.
U.S. - CERCLA/SARA - Section 302 (40 CFR § 355 Appendices A and B - The List of Extremely Hazardous Substances and Their Threshold Planning Quantities):	No components of this product are subject to the SARA Section 302 (40 CFR 355) reporting requirements.
U.S. - CERCLA/SARA - Section 313 (40 CFR § 372.65 Toxic Chemical Release Reporting):	No components of this product are subject to the SARA Section 313 (40 CFR 372.65) reporting requirements.
U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances:	No components found on the California Director's List of Hazardous Substances.
U.S. - California - 8 CCR Section 5200-5220 - Specifically Regulated Carcinogens:	No components found on the California Specifically Regulated Carcinogens List.
U.S. - California - 8 CCR Section 5203 Carcinogens:	No components found on the California Section 5203 Carcinogens List.
U.S. - California - 8 CCR Section 5209 Carcinogens:	No components found on the California Section 5209 Carcinogens List.
U.S. - Massachusetts - General Law Chapter 111F (MGL c 111F) - Hazardous Substances Disclosure by Employers (a.k.a. Right to Know Law):	No components regulated under the Massachusetts Hazardous Substances Disclosure by Employers Law.
U.S. - Minnesota Employee Right-to-Know (5206.0400, Subpart 5. List of Hazardous Substances):	No components found on the Minnesota Employee Right-to-Know List of Hazardous Substances.
U.S. - New Jersey - Worker and Community Right to Know Act (N.J.S.A. 34:5A-1):	No components regulated under the New Jersey Worker and Community Right-to-Know Act.
U.S. - Pennsylvania - Part XIII. Worker and Community Right-to-Know Act (Chapters 301-323):	Sodium bisulphite, Water
U.S. - Rhode Island - Title 28 Labor and Labor Relations (Chapters 28-21 Hazardous Substance Right-to-Know Act):	No components regulated under the Rhode Island Hazardous Substance Right-to-Know Act.

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

KODAK Hypo Clearing Agent, Working solution
CONTAINS: Sodium sulphite (7757-83-7), Sodium bisulphite (7631-90-5).
WARNING! MAY BE HARMFUL IF SWALLOWED.
Avoid breathing mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling. **FIRST AID:** If symptomatic, move to fresh air. Get medical attention if symptoms occur. Any material that contacts the eye should be washed out immediately with water. If easy to do, remove contact lens, if worn. Get medical attention if symptoms occur. Wash off with soap and water. Get medical attention if symptoms occur. If swallowed, DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Call a physician or poison control centre immediately. Keep out of reach of children. Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood. Since emptied containers retain product residue, follow label warnings even after container is emptied. **IN CASE OF FIRE:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. **IN CASE OF SPILL:** Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. Additional Components Include: Water (7732-18-5), Sodium citrate (68-04-2).

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-1, S-1, F-0, C-0

Kodak TAKE PICTURES. FURTHER.™
Material Safety Data Sheets

MSDS Product Name: KODAK PHOTO-FLO 200 Solution

MATERIAL SAFETY DATA SHEET

200000879/F/USA
Approval Date: 10/12/2000
Print Date: 11/25/2000

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KODAK PHOTO-FLO 200 Solution

Catalog Number(s): 146 4502 - 4 fluid ounce(s)
146 4510 - 16 fluid ounce(s)

Manufacturer/Supplier: EASTMAN KODAK COMPANY, Rochester, New York 14650

For Emergency Health, Safety & Environmental Information, call (716) 722-5151

For other information or to request an MSDS, call (800) 242-2424.

Synonym(s): KAN 354804; PCD 3107; F-0107.000

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Weight %	Component - (CAS Registry No.)
60-70	Water (007732-18-5)
25-30	Propylene glycol (000057-55-6)
5-10	p-tert-octylphenoxy polyethoxyethyl alcohol (009002-93-1)

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3. HAZARDS IDENTIFICATION

CONTAINS: P-tert-octylphenoxy polyethoxyethyl alcohol (009002-93-1)

WARNING!
CAUSES EYE IRRITATION
PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE IRRITATION

HMIS Hazard Ratings:

Health - 2, Flammability - 1, Reactivity - 0, Personal Protection - A

NFPA Hazard Ratings:
Health - 1, Flammability - 1, Reactivity (Stability) - 0

NOTE: HMIS and NFPA hazard indexes involve data review and interpretation that may vary among companies. They are intended only for rapid, general identification of the magnitude of the potential hazards. The personal protection index is only intended for general guidance on personal protection equipment (PPE) that is suitable for the potential hazards of the material. PPE (e.g., respirators) may not be needed if engineering controls (e.g., local ventilation) are adequate. An asterisk (*), in the HMIS health field, designates potential chronic or target organ hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

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4. FIRST-AID MEASURES

Inhalation: If symptomatic, move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

Eyes: Immediately flush with plenty of water for at least 15 minutes. Get medical attention.

Skin: Wash with soap and water. Get medical attention if symptoms occur.

Ingestion: Drink 1-2 glasses of water. Seek medical attention. Never give anything by mouth to an unconscious person.

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5. FIRE FIGHTING MEASURES

Extinguishing Media: Water spray, carbon dioxide (CO_2), dry chemical, alcohol foam

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing.

Hazardous Combustion Products: Carbon dioxide, carbon monoxide

Unusual Fire and Explosion Hazards: None

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6. ACCIDENTAL RELEASE MEASURES

Flush to sewer with large amounts of water.

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7. HANDLING AND STORAGE

Personal Precautionary Measures: Avoid contact with eyes and prolonged or repeated contact with skin. Use with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion: Keep from contact with oxidizing materials.

Storage: Keep container closed.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits: Not established

Ventilation: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions.

Respiratory Protection: None should be needed.

Eye Protection: Wear safety glasses with side shields (or goggles).

Skin Protection: It is a good industrial hygiene practice to minimize skin contact. For operations where prolonged or repeated skin contact may occur, impervious gloves should be worn.

Recommended Decontamination Facilities: Eye bath, washing facilities, safety shower

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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form: Liquid
Color: Colorless
Odor: Odorless
Specific Gravity (water = 1): 1.028
Vapor Pressure at 20°C (68°F): 24 mbar (18 mm Hg)
Vapor Density (Air = 1): 0.6
Volatile Fraction by Weight: 60-70 %
Boiling Point: >100°C (>212°F)
Solubility in Water: Complete
pH: 7.0
Flash Point: None

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10. STABILITY AND REACTIVITY

Stability: Stable

Incompatibility: Strong oxidizing agents

Hazardous Polymerization: Will not occur.

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11. TOXICOLOGICAL INFORMATION

Effects of Exposure:

Inhalation: Expected to be a low hazard for recommended handling.

Eyes: Causes irritation.

Skin: Prolonged or repeated skin contact may cause irritation.

Ingestion: Expected to be a low ingestion hazard.

Acute Toxicity Data:

Oral LD-50 (rat): 5000 mg/kg
Skin irritation: slight irritation
Eye irritation: moderate irritation

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12. ECOLOGICAL INFORMATION

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity

Fish LC50 mg/l:	10-100
Daphnid EC50 mg/l:	Not available
Algal IC50 mg/l:	Not available

Organics Readily Degradable (>70%):	Yes (7 days)
Potential Bioaccumulation:	Log Pow <1
COD (approximate g/l):	201
BOD5 (approximate g/l):	377

Potential Toxicity

Waste treatment microorganisms EC50 (mg/l):	Not available

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13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local
laws. Flush to sewer with large amounts of water.

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14. TRANSPORT INFORMATION

For transportation information regarding this product call the Kodak Worldwide
Transportation Hazmat Hot Line: (716) 722-2400 between 8 a.m. and 5 p.m. (Eastern Standard Time), Monday through Friday.

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15. REGULATORY INFORMATION

- Material(s) known to the State of California to cause cancer: None
- Material(s) known to the State of California to cause adverse reproductive
  effects: None

- Carcinogenicity Classification (components present at 0.1% or more):
  - International Agency for Research on Cancer (IARC): None
  - American Conference of Governmental Industrial Hygienists (ACGIH): None
  - National Toxicology Program (NTP): None
  - Occupational Safety and Health Administration (OSHA): None

- Chemical(s) subject to the reporting requirements of Section 313 or Title
  III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and
  40 CFR Part 372: None

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16. OTHER INFORMATION

US/Canadian Label Statements:

CONTAINS: P-tert-octylphenoxy polyethoxyethyl alcohol (009002-93-1)

WARNING!
CAUSES EYE IRRITATION
PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE IRRITATION

Avoid contact with eyes and prolonged or repeated contact with skin.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: In case of eye contact, immediately flush eyes with plenty of
water for at least 15 minutes. Get medical attention.

Keep out of reach of children.

For additional information, see Material Safety Data Sheet (MSDS) for this material.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

R-1, S-2, F-1, C-0

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Material Safety Data Sheet

1. Identification of the substance/preparation and of the company/undertaking

Product name: KODAK T-MAX Developer

Product code: 1599844

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York, 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For other information or to request an MSDS, call (800) 242-2424.

Synonyms: None.

Product Use: photographic processing chemical (developer/activator), For industrial use only.

2. Hazards identification

CONTAINS: Diethanolamine-sulphur dioxide complex (63149-47-3), Hydroquinone (123-31-9), Sodium metabisulphite (7681-57-4), 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (13047-13-7)

WARNING!
HEAT SENSITIVE - CAN DECOMPOSE IF HEATED
HARMFUL IF SWALLOWED
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION
CAN CAUSE LIVER AND KIDNEY DAMAGE

NFPA Hazard Ratings: Health - 3, Flammability - 1, Instability - 0

NOTE: NFPA 704 (2007) hazard indexes involves data review and interpretation that may vary among companies. It is intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight %	Components - (CAS-No.)
50 - 60	Water (7732-18-5)
35 - 45	Diethanolamine-sulphur dioxide complex (63149-47-3)
1 - 5	Sodium metabisulphite (7681-57-4)
1 - 5	Hydroquinone (123-31-9)
0.1 - 1	4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (13047-13-7)

4. First aid measures

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms occur.

Eyes: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

5. Fire-fighting measures

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool unopened containers.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products: Carbon oxides, nitrogen oxides (NOx), Sulphur oxides, (see also Hazardous Decomposition Products section).

Unusual Fire and Explosion Hazards: Elevated temperature can cause decomposition.

6. Accidental release measures

Absorb spill with vermiculite or other inert material. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Avoid breathing mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion: Keep away from heat and sources of ignition. Keep from contact with oxidizing materials.

Storage: Store in cool place. Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls / personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Sodium metabisulphite	ACGIH	time weighted average	5 mg/m3
Hydroquinone	ACGIH	time weighted average	2 mg/m3
	OSHA Z1	Permissible exposure limit	2 mg/m3
4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone	EK HPG	Time Weighted Average (TWA):	0.2 mg/m3

Sulphur dioxide	ACGIH	time weighted average	2 ppm
	ACGIH	Short term exposure limit	5 ppm
	OSHA Z1	Permissible exposure limit	5 ppm 13 mg/m3

Ventilation: Good general ventilation should be used. Ventilation should be sufficient so that applicable occupational exposure limits are not exceeded. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances.

Respiratory protection: None should be needed. If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: Acid gas. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

9. Physical and chemical properties

Physical form: liquid

Colour: colourless

Odour: amine

Specific gravity: > 1

Vapour pressure: 24 mbar (18.0 mm Hg)

Vapour density: 0.6

Volatile fraction by weight: 50 - 60 %

Boiling point/boilingrange: > 100.0 °C (> 212.0 °F) (estimated)

Water solubility: complete

pH: 8.3

Flash point: does not flash

10. Stability and reactivity

Stability: Stable under normal conditions. Safe handling temperatures are dependent on specific conditions of use and are typically substantially below the onset temperature. Consult your technical safety experts.

Incompatibility: Strong oxidizing agents, Strong acids.

Hazardous decomposition products: Sulphur oxides, nitrogen oxides (NOx).

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Diethanolamine-sulphur dioxide complex. May cause liver damage based on animal data. May cause kidney damage based on animal data.

Contains: Sodium metabisulphite. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Contains: Hydroquinone. There is insufficient evidence for classifying hydroquinone as a suspected carcinogenic or mutagenic substance in humans. No increases in cancer rates were observed in an epidemiology study which looked at mortality among more than 800 persons employed primarily in the manufacture of hydroquinone. Carcinogenicity studies in animals were inconclusive. Rats and mice were given hydroquinone by stomach tube or at high concentrations in the diet. Responses were not consistent across route of exposure, species or sex. The International Agency for Research on Cancer (IARC) has classified hydroquinone in Group 3, i.e., "not classifiable" as a carcinogen. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome breakage) of hydroquinone in vivo and in vitro. The relevance of chromosomal effects in test animals in predicting human risk is unclear.

Contains: 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone. May cause adverse reproductive effects such as infertility based on animal data. Based on repeated-dose ingestion studies in animals, this chemical may cause blood, testicular, and adverse reproductive effects.

Inhalation: Expected to be a low hazard for recommended handling. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes: Causes eye irritation. Airborne dust/mist/vapor irritating.

Skin: May cause allergic skin reaction based on human experience. May cause skin depigmentation. Prolonged or repeated contact may cause drying, cracking, or irritation.

Ingestion: Harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

Data for Diethanolamine-sulphur dioxide complex (CAS 63149-47-3):

Acute Toxicity Data:

- Oral LD50 (male rat): 1,903 mg/kg
- Oral LD50 (female rat): 1,131 mg/kg
- Dermal LD50: >20 ml/kg

- Dermal LD50 (guinea pig): >20 ml/kg
- Skin irritation: slight
- Skin irritation: no exacerbation (repeated skin application)
- Skin Sensitization: none
- Skin Sensitization (guinea pig): none
- Skin Sensitization (guinea pig): negative
- Eye irritation: slight
- Eye irritation (washed eyes): slight
- Eye irritation (unwashed eyes): slight

Data for Sodium metabisulphite (CAS 7681-57-4):

Acute Toxicity Data:

- Oral LD50 (male rat): 1,900 mg/kg
- Oral LD50 (female rat): 1,130 mg/kg
- Dermal LD50: > 1,000 mg/kg
- Skin irritation: slight
- Skin irritation: moderate (repeated skin application)
- Skin Sensitization: none
- Eye irritation: moderate to strong

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Oral (14-day, rat): NOEL; > 1105 mg/kg/day

Data for Hydroquinone (CAS 123-31-9):

Acute Toxicity Data:

- Oral LD50 (rat): 400 mg/kg
- Oral LD50 (male rat): 400 mg/kg
- Oral LD50 (male mouse): 100 - 200 mg/kg
- Dermal LD50 (guinea pig): > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm 2 / hour
- Skin irritation: slight
- Skin Sensitization (guinea pig): positive
- Eye irritation: moderate

Mutagenicity/Genotoxicity Data:

- Salmonella typhimurium assay (Ames test): negative (in presence and absence of activation)
- Chromosomal aberration assay: negative (in absence of activation)
- Chromosomal aberration assay: positive (in presence of activation)
- Sister chromatid exchange (SCE) assay: positive (in presence and absence of activation)

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Dermal (17-day, rat): NOEL; 3800 mg/kg/day
- Dermal (17-day): LOEL (Lowest observable effect level); 4800 mg/kg/day

Developmental Toxicity Data:

- Oral (female rabbit): NOEL for developmental toxicity; 25mg/kg/day

Data for 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (CAS 13047-13-7):

Acute Toxicity Data:

- Oral LD50 (rat): 566 mg/kg
- Oral LD50: 283 mg/kg
- Dermal LD50: > 1,000 mg/kg
- Skin irritation: slight
- Skin irritation: slight exacerbation (repeated skin application)
- Skin Sensitization: slight
- Eye irritation: strong irritation
- Eye irritation (unwashed eyes): strong
- Eye irritation (washed eyes): slight to moderate

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Oral (12-day, rat): NOEL; 88 mg/kg/day
- Oral (12-day, rat): LOEL (Lowest observable effect level); 440 mg/kg/day (target organ effects: blood, target organ effects: testes)
- Oral (28-day, rat): NOEL; 10 mg/kg/day
- Oral (28-day, rat): LOEL (Lowest observable effect level); 40 mg/kg/day (target organ effects: blood, target organ effects: testes)

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	1 - 10 mg/l
Toxicity to daphnia (EC50):	1 - 10 mg/l
Toxicity to algae (IC50):	10 - 100 mg/l

Toxicity to other organisms (EC50):	> 100 mg/l (sludge)
Persistence and degradability:	Readily biodegradable.
Chemical Oxygen Demand (COD):	ca. 712 g/l
Biochemical Oxygen Demand (BOD):	ca. 612 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
INV (CN)	y (positive listing)
PICCS (PH)	y (positive listing)
EINECS	n (Negative listing)
ENCS (JP)	n (Negative listing)
KECI (KR)	n (Negative listing)
AICS	n (Negative listing)
TSCA	n (Negative listing)
DSL	y (positive listing)

A N (Negative listing) indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	none
International Agency for Research on Cancer (IARC):	none
U.S. National Toxicology Program (NTP):	none
U.S. Occupational Safety and Health Administration (OSHA):	none
California Prop. 65:	none
US. Pennsylvania Worker and Community Right-to-Know Law (34	Water, Diethanolamine-sulphur dioxide

Pa. Code Chap. 301-323):	complex, Sodium metabisulphite, Hydroquinone
US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000):	Nitrilotriacetic acid, trisodium salt
US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5):	Water, Diethanolamine-sulphur dioxide complex, Sodium metabisulphite, Hydroquinone
US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:	Hydroquinone

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

CONTAINS: Diethanolamine-sulphur dioxide complex (63149-47-3), Hydroquinone (123-31-9), Sodium metabisulphite (7681-57-4), 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (13047-13-7)

WARNING!
HEAT SENSITIVE - CAN DECOMPOSE IF HEATED
HARMFUL IF SWALLOWED
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION
CAN CAUSE LIVER AND KIDNEY DAMAGE

Store in a cool place.
Avoid breathing mist or vapour at concentrations greater than the exposure limits.
Avoid contact with eyes, skin, and clothing.
Use only with adequate ventilation.
Wash thoroughly after handling.
FOR R&D USE ONLY - CONTAINS A COMPONENT NOT ON TSCA INVENTORY

FIRST AID: If symptomatic, move to fresh air. Get medical attention if symptoms occur. Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Keep out of reach of children.

Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

IN CASE OF FIRE: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool unopened containers.

IN CASE OF SPILL: Absorb spill with vermiculite or other inert material. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-1, S-2, F-1, C-1HT

Material Safety Data Sheet

1. Identification of the substance/preparation and of the company/undertaking

Product name: KODAK T-MAX Developer

Product code: 1599844

Supplier: EASTMAN KODAK COMPANY, 343 State Street, Rochester, New York, 14650

For Emergency Health, Safety & Environmental Information, call (585) 722-5151 (USA)

For other information or to request an MSDS, call (800) 242-2424.

Synonyms: None.

Product Use: photographic processing chemical (developer/activator), For industrial use only.

2. Hazards identification

CONTAINS: Diethanolamine-sulphur dioxide complex (63149-47-3), Hydroquinone (123-31-9), Sodium metabisulphite (7681-57-4), 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (13047-13-7)

WARNING!
HEAT SENSITIVE - CAN DECOMPOSE IF HEATED
HARMFUL IF SWALLOWED
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION
CAN CAUSE LIVER AND KIDNEY DAMAGE

NFPA Hazard Ratings: Health - 3, Flammability - 1, Instability - 0

NOTE: NFPA 704 (2007) hazard indexes involves data review and interpretation that may vary among companies. It is intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight %	Components - (CAS-No.)
50 - 60	Water (7732-18-5)
35 - 45	Diethanolamine-sulphur dioxide complex (63149-47-3)
1 - 5	Sodium metabisulphite (7681-57-4)
1 - 5	Hydroquinone (123-31-9)
0.1 - 1	4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (13047-13-7)

4. First aid measures

Inhalation: If symptomatic, move to fresh air. Get medical attention if symptoms occur.

Eyes: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

5. Fire-fighting measures

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool unopened containers.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products.

Hazardous Combustion Products: Carbon oxides, nitrogen oxides (NOx), Sulphur oxides, (see also Hazardous Decomposition Products section).

Unusual Fire and Explosion Hazards: Elevated temperature can cause decomposition.

6. Accidental release measures

Absorb spill with vermiculite or other inert material. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: Avoid breathing mist or vapour at concentrations greater than the exposure limits. Avoid contact with eyes, skin, and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Prevention of Fire and Explosion: Keep away from heat and sources of ignition. Keep from contact with oxidizing materials.

Storage: Store in cool place. Keep container tightly closed. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls / personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Sodium metabisulphite	ACGIH	time weighted average	5 mg/m3
Hydroquinone	ACGIH	time weighted average	2 mg/m3
	OSHA Z1	Permissible exposure limit	2 mg/m3
4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone	EK HPG	Time Weighted Average (TWA):	0.2 mg/m3

Sulphur dioxide	ACGIH	time weighted average	2 ppm
	ACGIH	Short term exposure limit	5 ppm
	OSHA Z1	Permissible exposure limit	5 ppm 13 mg/m3

Ventilation: Good general ventilation should be used. Ventilation should be sufficient so that applicable occupational exposure limits are not exceeded. Ventilation rates should be matched to conditions. Supplementary local exhaust ventilation, closed systems, or respiratory protection may be needed in special circumstances.

Respiratory protection: None should be needed. If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. A respirator should be worn if hazardous decomposition products are likely to be or have been released. Respirator type: Acid gas. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Hand protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

9. Physical and chemical properties

Physical form: liquid

Colour: colourless

Odour: amine

Specific gravity: > 1

Vapour pressure: 24 mbar (18.0 mm Hg)

Vapour density: 0.6

Volatile fraction by weight: 50 - 60 %

Boiling point/boilingrange: > 100.0 °C (> 212.0 °F) (estimated)

Water solubility: complete

pH: 8.3

Flash point: does not flash

10. Stability and reactivity

Stability: Stable under normal conditions. Safe handling temperatures are dependent on specific conditions of use and are typically substantially below the onset temperature. Consult your technical safety experts.

Incompatibility: Strong oxidizing agents, Strong acids.

Hazardous decomposition products: Sulphur oxides, nitrogen oxides (NOx).

Hazardous Polymerization: Hazardous polymerisation does not occur.

11. Toxicological information

Effects of Exposure

General advice:

Contains: Diethanolamine-sulphur dioxide complex. May cause liver damage based on animal data. May cause kidney damage based on animal data.

Contains: Sodium metabisulphite. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Contains: Hydroquinone. There is insufficient evidence for classifying hydroquinone as a suspected carcinogenic or mutagenic substance in humans. No increases in cancer rates were observed in an epidemiology study which looked at mortality among more than 800 persons employed primarily in the manufacture of hydroquinone. Carcinogenicity studies in animals were inconclusive. Rats and mice were given hydroquinone by stomach tube or at high concentrations in the diet. Responses were not consistent across route of exposure, species or sex. The International Agency for Research on Cancer (IARC) has classified hydroquinone in Group 3, i.e., "not classifiable" as a carcinogen. Hydroquinone is generally negative in bacterial mutagenicity tests; there is evidence for the clastogenicity (chromosome breakage) of hydroquinone in vivo and in vitro. The relevance of chromosomal effects in test animals in predicting human risk is unclear.

Contains: 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone. May cause adverse reproductive effects such as infertility based on animal data. Based on repeated-dose ingestion studies in animals, this chemical may cause blood, testicular, and adverse reproductive effects.

Inhalation: Expected to be a low hazard for recommended handling. In contact with strong acids or if heated, sulphites may liberate sulphur dioxide gas. Sulphur dioxide gas is irritating to the respiratory tract. Some asthmatics or hypersensitive individuals may experience difficult breathing.

Eyes: Causes eye irritation. Airborne dust/mist/vapor irritating.

Skin: May cause allergic skin reaction based on human experience. May cause skin depigmentation. Prolonged or repeated contact may cause drying, cracking, or irritation.

Ingestion: Harmful if swallowed. Some asthmatics or sulfite-sensitive individuals may experience wheezing, chest tightness, stomach upset, hives, faintness, weakness and diarrhea.

Data for Diethanolamine-sulphur dioxide complex (CAS 63149-47-3):

Acute Toxicity Data:

- Oral LD50 (male rat): 1,903 mg/kg
- Oral LD50 (female rat): 1,131 mg/kg
- Dermal LD50: >20 ml/kg

- Dermal LD50 (guinea pig): >20 ml/kg
- Skin irritation: slight
- Skin irritation: no exacerbation (repeated skin application)
- Skin Sensitization: none
- Skin Sensitization (guinea pig): none
- Skin Sensitization (guinea pig): negative
- Eye irritation: slight
- Eye irritation (washed eyes): slight
- Eye irritation (unwashed eyes): slight

Data for Sodium metabisulphite (CAS 7681-57-4):

Acute Toxicity Data:

- Oral LD50 (male rat): 1,900 mg/kg
- Oral LD50 (female rat): 1,130 mg/kg
- Dermal LD50: > 1,000 mg/kg
- Skin irritation: slight
- Skin irritation: moderate (repeated skin application)
- Skin Sensitization: none
- Eye irritation: moderate to strong

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Oral (14-day, rat): NOEL; > 1105 mg/kg/day

Data for Hydroquinone (CAS 123-31-9):

Acute Toxicity Data:

- Oral LD50 (rat): 400 mg/kg
- Oral LD50 (male rat): 400 mg/kg
- Oral LD50 (male mouse): 100 - 200 mg/kg
- Dermal LD50 (guinea pig): > 1,000 mg/kg
- Dermal absorption rate: 1.1 micrograms (s) / cm 2 / hour
- Skin irritation: slight
- Skin Sensitization (guinea pig): positive
- Eye irritation: moderate

Mutagenicity/Genotoxicity Data:

- Salmonella typhimurium assay (Ames test): negative (in presence and absence of activation)
- Chromosomal aberration assay: negative (in absence of activation)
- Chromosomal aberration assay: positive (in presence of activation)
- Sister chromatid exchange (SCE) assay: positive (in presence and absence of activation)

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Dermal (17-day, rat): NOEL; 3800 mg/kg/day
- Dermal (17-day): LOEL (Lowest observable effect level); 4800 mg/kg/day

Developmental Toxicity Data:

- Oral (female rabbit): NOEL for developmental toxicity; 25mg/kg/day

Data for 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (CAS 13047-13-7):

Acute Toxicity Data:

- Oral LD50 (rat): 566 mg/kg
- Oral LD50: 283 mg/kg
- Dermal LD50: > 1,000 mg/kg
- Skin irritation: slight
- Skin irritation: slight exacerbation (repeated skin application)
- Skin Sensitization: slight
- Eye irritation: strong irritation
- Eye irritation (unwashed eyes): strong
- Eye irritation (washed eyes): slight to moderate

Definitions for the following section(s): LOEL =lowest-observed-effect level, LOAEL = lowest-observed-adverse-effect, NOAEL = no observed-adverse-effect level, NOEL =no-observed-effect level.

Repeated dose toxicity:

- Oral (12-day, rat): NOEL; 88 mg/kg/day
- Oral (12-day, rat): LOEL (Lowest observable effect level); 440 mg/kg/day (target organ effects: blood, target organ effects: testes)
- Oral (28-day, rat): NOEL; 10 mg/kg/day
- Oral (28-day, rat): LOEL (Lowest observable effect level); 40 mg/kg/day (target organ effects: blood, target organ effects: testes)

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Toxicity to fish (LC50):	1 - 10 mg/l
Toxicity to daphnia (EC50):	1 - 10 mg/l
Toxicity to algae (IC50):	10 - 100 mg/l

Toxicity to other organisms (EC50):	> 100 mg/l (sludge)
Persistence and degradability:	Readily biodegradable.
Chemical Oxygen Demand (COD):	ca. 712 g/l
Biochemical Oxygen Demand (BOD):	ca. 612 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

Not regulated for all modes of transportation.

For more transportation information, go to: www.kodak.com/go/ship.

15. Regulatory information

Notification status

Regulatory List	Notification status
INV (CN)	y (positive listing)
PICCS (PH)	y (positive listing)
EINECS	n (Negative listing)
ENCS (JP)	n (Negative listing)
KECI (KR)	n (Negative listing)
AICS	n (Negative listing)
TSCA	n (Negative listing)
DSL	y (positive listing)

A N (Negative listing) indicates one or more component is either not on the public Inventory or is subject to exemption requirements. If additional information is needed contact Kodak.

Other regulations

American Conference of Governmental Industrial Hygienists (ACGIH):	none
International Agency for Research on Cancer (IARC):	none
U.S. National Toxicology Program (NTP):	none
U.S. Occupational Safety and Health Administration (OSHA):	none
California Prop. 65:	none
US. Pennsylvania Worker and Community Right-to-Know Law (34	Water, Diethanolamine-sulphur dioxide

Pa. Code Chap. 301-323):	complex, Sodium metabisulphite, Hydroquinone
US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000):	Nitrilotriacetic acid, trisodium salt
US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5):	Water, Diethanolamine-sulphur dioxide complex, Sodium metabisulphite, Hydroquinone
US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:	Hydroquinone

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

CONTAINS: Diethanolamine-sulphur dioxide complex (63149-47-3), Hydroquinone (123-31-9), Sodium metabisulphite (7681-57-4), 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidinone (13047-13-7)

WARNING!
HEAT SENSITIVE - CAN DECOMPOSE IF HEATED
HARMFUL IF SWALLOWED
CAUSES EYE IRRITATION
MAY CAUSE ALLERGIC SKIN REACTION
CAN CAUSE LIVER AND KIDNEY DAMAGE

Store in a cool place.
Avoid breathing mist or vapour at concentrations greater than the exposure limits.
Avoid contact with eyes, skin, and clothing.
Use only with adequate ventilation.
Wash thoroughly after handling.
FOR R&D USE ONLY - CONTAINS A COMPONENT NOT ON TSCA INVENTORY

FIRST AID: If symptomatic, move to fresh air. Get medical attention if symptoms occur. Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, do NOT induce vomiting. Give victim a glass of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Keep out of reach of children.

Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood.

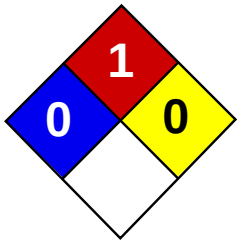
Since emptied containers retain product residue, follow label warnings even after container is emptied.

IN CASE OF FIRE: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool unopened containers.

IN CASE OF SPILL: Absorb spill with vermiculite or other inert material. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-1, S-2, F-1, C-1HT



Health	2
Fire	1
Reactivity	0
Personal Protection	J

Material Safety Data Sheet
L-Tartaric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: L-Tartaric acid

Catalog Codes: SLT1033, SLT3616, SLT1600

CAS#: 87-69-4

RTECS: WW7875000

TSCA: TSCA 8(b) inventory: L-Tartaric acid

CI#: Not available.

Synonym: 2,3-Dihydroxybutanedioic acid; L-(+)-Tartaric Acid; Malic acid, 3-hydroxy-; Succinic acid, 2,3-dihydroxy

Chemical Name: Tartaric Acid

Chemical Formula: HOOC(CHOH)2COOH

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{L-}Tartaric acid	87-69-4	100

Toxicological Data on Ingredients: L-Tartaric acid LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation (lung irritant). Corrosive to eyes and skin. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Severe over-exposure can produce lung damage, choking, unconsciousness or death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: 425°C (797°F)

Flash Points: OPEN CUP: 210°C (410°F).

Flammable Limits: Not available.

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Slightly flammable to flammable in presence of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Slightly explosive in presence of open flames and sparks. Non-explosive in presence of shocks.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: As with most organic solids, fire is possible at elevated temperatures

Special Remarks on Explosion Hazards:
Fine dust dispersed in air in sufficient concentrations, and in the presences of an ignition source is a potential dust explosion hazard.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Keep container dry. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Never add water to this product. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline solid.)

Odor: Odorless.

Taste: Acid.

Molecular Weight: 150.09 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: 168°C (334.4°F) - 172 C

Critical Temperature: Not available.

Specific Gravity: Density: 1.76 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 5.18 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether.

Solubility:
Easily soluble in cold water, hot water, methanol. Soluble in diethyl ether. Solubility in Water: 1g/0.75 ml at room temperature. 1g/0.5 ml boiling water 115 g/100 ml @ 0 C 126 g/100 ml @ 10 C 139 g/100 ml @ 20 C 156 g/100 ml @ 30 C 176 g/100 ml @ 40 C 195 g/100 ml @ 50 C 217 g/100 ml @ 60 C 244 g/100 ml @ 70 C 273 g/100 ml @ 80 C 307 g/100 ml @ 90 C Solubility in methanol: 1 g/1.7 ml Solubility in ethanol: 1 g/3 ml Solubility in propanol: 1 g/10.5 ml Solubility in ether: 1 g/250 ml Also soluble in glycerol. Insoluble in chloroform

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, dust generation, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Violent reaction possible with silver. Aqueous solution of tartaric acid can liberate explosive H2 gas if contact with reactive metals (Iron, Zinc, Aluminum)

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation (lung irritant).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Rat - Route: oral; Dose: 7500 mg/kg LDL [Rabbit] - Route: Oral; Dose: 5000 mg/kg LDL [Dog] - Rout: Oral; Dose: 5000 mg/kg Lethal Dose/Conc 50% kill: LD50 [Mouse] - Route: Intravenous; Dose: 485 mg/kg

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Causes skin irritation Eyes: Causes eye irritation Inhalation: Causes respiratory tract irritation Ingestion: Causes gastrointestinal tract irritation with nausea, vomiting and diarrhea. May affect kidneys (kidney damage), blood, and behavior (convulsions, somnolence), and respiration. Chronic Potential Health Effects: Ingestion: Repeated or prolonged ingestion may cause lesions of the mouth, gastric ulcers, gastrointestinal hyperacidity, and symptoms similar to those of metal fume fever - flu-like condition with fever, chills, sweats, nausea, vomiting, muscle aches, pains, and weakness. Skin: Repeated or prolonged skin contact may cause skin ulcerations or lesions.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: L-Tartaric acid

Other Regulations: Not available.

Other Classifications:

WHMIS (Canada): CLASS E: Corrosive solid.

DSCL (EEC):
R36/37/38- Irritating to eyes, respiratory system and skin. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 1

Reactivity: 0

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 12:00 AM

Last Updated: 05/21/2013 12:00 PM

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SPRINT®
SYSTEMS OF PHOTOGRAPHY

STANDARD FILM DEVELOPER

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name . . . . . Standard B&W Film Developer
Catalog Number . . . . . N/A
Chemical Name . . . . . Mixture
Common Name . . . . . N/A
Product Use . . . . . Developer for black and white film.

MANUFACTURER

Sprint Systems of Photography, Inc.
1057 Chopmist Hill Road
Scituate, RI 02857
800 356-5073

EMERGENCY TELEPHONE NUMBER

ChemTel (1-800-255-3924)

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	EXPOSURE CONTROLS	
		OSHA PEL	ACGIH TLV
Dimethylformamide	68-12-2	10 ppm	10 ppm
Diethylene glycol	111-46-6	N/A	N/E
Ethylene glycol	107-21-1	N/E	100 mg/m^3 (Aerosol)
Hydroquinone	123-31-9	2 mg/m^3	2 mg/m^3
Sodium metabisulfite	7681-57-4	N/E	5 mg/m^3
Sodium metaborate	7775-19-1	N/E	N/E
Water	7732-18-5	N/E	N/E

See Section 15 for OSHA Regulatory Status

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Light yellow to brown solution with a sulfur dioxide odor.

Warning! May cause skin sensitization. May cause mild irritation to skin, eyes, and the respiratory tract. Harmful if swallowed. May be absorbed through skin. May cause life threatening asthma.

Will not burn. In case of fire, use extinguishing media suitable for the material that is burning.

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTE(S) OF ENTRY

Inhalation (breathing), eye and skin contact.

SYMPTOMS OF EXPOSURE

Skin Contact: May cause mild irritation. May be absorbed through skin causing effects similar to ingestion or inhalation. Contact may cause sensitization.

Inhalation: Breathing vapors or mist may irritate the mucous membranes of the nose, throat, respiratory tract, and may cause headache, light-headedness, dizziness, nausea, and liver injury.

Eye Contact: May cause mild irritation.

Ingestion: Can cause kidney damage, and may be toxic to the embryo or cause teratogenic effects. Can cause life-threatening asthma.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing skin disorders, eye problems, or impaired liver and kidneys. Persons sensitized to sodium metabisulfite are at risk.

REPORTED AS CARCINOGEN OR POTENTIAL CARCINOGEN

✓ Not Applicable
_ OSHA Suspect Carcinogen
_ National Toxicology Program (NTP)
_ International Agency for Research on Cancer (IARC)

4. FIRST AID MEASURES

Skin contact: Wash affected areas with plenty of water, and soap if available, for several minutes. Seek medical attention if irritation develops and persists.

Inhalation: Remove from area to fresh air. Seek medical attention if respiratory irritation develops or if breathing becomes difficult. Get immediate medical attention. If victim is having trouble breathing, transport to medical care and, if available, give supplemental oxygen.

Eye contact: Rinse eye with water. Remove any contact lenses, and continue flushing with plenty of water for several minutes. Seek medical attention if irritation develops and persists..

Ingestion: Give 3-4 glasses of water, but DO NOT induce vomiting. If vomiting occurs, give fluids again. Get medical attention to determine whether vomiting or evacuation of stomach is necessary. Do not give anything by mouth to an unconscious or convulsing person.

NOTE TO PHYSICIAN

None known.

5. FIRE FIGHTING MEASURES

Flash Point and Method . . . . . > 200 ˚F (PM CC)

GENERAL HAZARD

Fire or excessive heat may produce hazardous decomposition products.

EXTINGUISHING MEDIA

In case of fire, use extinguishing media suitable for the material that is burning.

SPECIAL FIREFIGHTING INSTRUCTIONS

None known.

FIREFIGHTING EQUIPMENT

As in any fire, wear NIOSH approved, positive-pressure self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Wear appropriate protective equipment (See Section 8). Avoid contact with eyes, skin, and clothing.

Ventilate area of leak or spill. Absorb with kitty litter, sand or earth and package in a suitable container for disposal.

7. HANDLING AND STORAGE

HANDLING

Wear appropriate protective equipment (See Section 8). Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Use engineering controls to reduce air contaminants to permissible exposure level.

PERSONAL PROTECTION

Respirator: In conditions where high concentrations of vapors or mist are present or exposure limits are exceeded, wear a respirator that has been selected by technically qualified person for the specific work conditions.

Eye Protection: Wear approved safety glasses.

Gloves: Butyl rubber. Note: inspect gloves before each use and discard if they show tears, pinholes, or signs of wear.

Clothing: Wear long-sleeved clothing. Use rubber apron.

Other: Eye wash; safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

State	Liquid
Color	Light yellow to brown
Odor	Sulfur dioxide
Melting Point ˚F	N/A
Boiling Point ˚F	> 212
Specific Gravity @ 25 ˚F	1.2
Vapor Density (Air = 1)	N/A
Vapor Pressure (mm Hg)	Negligible
pH	8.7
Water Solubility	Soluble

Solubility in other liquids . . . . . N/E

10. STABILITY AND REACTIVITY

REACTIVITY

Stable under normal use conditions. Will decompose in acid solutions, liberating toxic and irritating sulfur dioxide gas.

INCOMPATIBILITIES

Acidic materials, strong oxidizers, metals, and organic materials.

HAZARDOUS DECOMPOSITION PRODUCTS

CO_2, CO, and oxides of sulfur.

CONDITIONS TO AVOID

Excessive heat, acids.

11. TOXICOLOGICAL INFORMATION

The product is not an irritant. The primary dermal irritation score was 0.08 following a 4-hour occluded dermal exposure in a modified FHSA/CPSC Design, 16 CFR 1500.

For Dimethylformamide:

Inhalation LC_{50} (mouse): 9,400 mg/m^3/2 hr
Oral LD_{50} (rat): 2,800 mg/kg
Oral LD_{50} (mouse): 42 mg/kg
Dermal LD_{50} (rabbit): 4,720 mg/kg

Long-term breathing of vapors by workers has caused liver damage (hepatitis).

For Diethylene glycol:

Oral LD_{50} (rat): 12,565 mg/kg
Oral LD_{50} (mouse): 23,700 mg/kg
Dermal LD_{50} (rabbit): 11,890 mg/kg

For Sodium metaborate:

Oral LD_{50} (rat): 2,330 mg/kg

A human study of an occupationally exposed borate worker population showed no adverse reproductive effects. Animal studies of similar inorganic borates demonstrated reproductive effects in males.

For Ethylene glycol

Inhalation LC_{50} (rat): 10,876 mg/kg
Oral LD_{50} (rat): 4,700 mg/kg
Oral LD_{50} (mouse): 5,500 mg/kg
Dermal LD_{50} (rabbit): 9,530 μL/kg

Swallowing can cause nausea, vomiting, abdominal pain and weakness, as well as drunkenness, dizziness, stupor, convulsions and coma. Death could result from respiratory arrest or cardiovascular collapse. Kidney damage may result.

Animal studies indicate that repeated ingestion can cause formation of bladder and kidney stones, as well as kidney damage.

For Hydroquinone:

Oral LD_{50} (rat): 320 mg/kg
Oral LD_{50} (mouse): 245 mg/kg

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

For Diethylene glycol:

96 hr LC_{50} (fathead minnow): >100 mg/L. Cond: Static.
96 hr LC_{50}(water flea); 0.3-1.0 mg/L. Cond: Static.
15min EC_{50} (Photobacterium phosphoreum): 228 mg/L Microtox test.

For Hydroquinone:

96 hr LC_{50} (rainbow trout): 0.097 mg/L.
96 hr LC_{50} (fathead minnow): 0.1-0.18 mg/L.
48 hr EC_{50} (water flea): 0.05 mg/L.
30 min EC_{50} (Photobacterium phosphoreum): 0.0382 mg/L Mictotox test.

For Ethylene glycol:

96 hr LC_{50} (rainbow trout): 41,000 mg/L. Cond: 20˚C.
96 hr LC_{50} (bluegill): 27,500-41,000 mg/L.
96 hr LC_{50} (goldfish): 27,500-41,000 mg/L.
96 hr LC_{50} (water flea): 46,300 mg/L.
30 min EC_{50} (Photobacterium phosphoreum): 620.0 mg/l Microtox test.

ENVIRONMENTAL MOVEMENT AND PARTITIONING

Not known.

ENVIRONMENTAL FATE

Not known.

13. DISPOSAL CONSIDERATIONS

RCRA Waste Code: . . . . . Not regulated.

14 TRANSPORT INFORMATION

Not regulated by DOT, ICAO, or IMDG.

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

✓ Hazardous _ Non-Hazardous

CERCLA/SUPERFUND (40 CFR 117, 302)

Hydroquinone; RQ - 100 lbs.

SARA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355)

Hydroquinone; TPQ - 500 lbs.

SARA HAZARD CATEGORIES (40 CFR 370)

✓ Acute ✓ Chronic _ Fire
_ Pressure _ Reactive _ None

SARA TOXIC CHEMICALS (40 CFR 372)

Hydroquinone - < 5%
Dimethylformamide - < 5%
Ethylene glycol - <5%

TSCA CHEMICAL SPECIFIC RULES

None known

INVENTORY STATUS

All ingredients of this product are on the TSCA inventory

STATE REGULATIONS

Florida Hazardous Substance List . . . Dimethylformamide, ethylene glycol, hydroquinone, and sodium metabisulfite.

Massachusetts Right To Know List . . . Dimethylformamide, ethylene glycol, hydroquinone, and sodium metabisulfite.

Minnesota Hazardous Substance List . Diethylene glycol, Dimethylformamide, ethylene glycol, hydroquinone, and sodium metabisulfite.

New Jersey Right To Know List . . . . . .Dimethylformamide, ethylene glycol, hydroquinone, potassium hydroxide, and sodium metabisulfite.

Rhode Island Hazardous Substance List: Dimethylformamide, ethylene glycol, hydroquinone, and sodium metabisulfite.

16. OTHER INFORMATION

NFPA RATING

Health	2
Fire	1
Reactivity	0

PREPARATION INFORMATION

Prepared by: Sprint Systems of Photography, Inc.
Date Prepared: . April 19, 2000
Replaces: November 10, 1999

REVISION INFORMATION

Sections 3, 4, 6, 7, 8, 11, 14 and 16 were updated to reflect results of a dermal irritation study.

ABBREVIATIONS

C - Ceiling limit
N/A - Not applicable
N/D - Not determined
N/E - Not established
N/K - Not known
NAERG - North American Emergency Response Guidebook
RQ - Reportable Quantity
TPQ - Threshold Planning Quantity

QUICK SILVER PRINT DEVELOPER

SPRINT® SYSTEMS OF PHOTOGRAPHY

MATERIAL SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name . . . . . Quicksilver Print Developer
Catalog Number . . . . . N/A
Chemical Name . . . . . Mixture
Common Name . . . . . N/A
Product Use . . . . . Photographic print developer.

MANUFACTURER

Sprint Systems of Photography, Inc.
1057 Chopmist Hill Road
Scituate, RI 02857
800 356-5073

EMERGENCY TELEPHONE NUMBER

ChemTel (1-800-255-3924)

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	EXPOSURE CONTROLS	
		OSHA PEL	ACGIH TLV
Diethylene glycol	111-46-6	N/E	N/E
Hydroquinone	123-31-9	2 mg/m^3	2 mg/m^3
Potassium carbonate	584-08-7	N/E	N/E
Sodium sulfite	7757-83-7	N/E	N/E
Water	7732-18-5	N/E	N/E

See Section 15 for OSHA Regulatory Status

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Light brown liquid with a mild, sweet odor.

Danger! Causes eye and skin burns. May cause life threatening asthma. May cause irritation to the respiratory tract. Contact may cause sensitization.

Will not burn. In case of fire use extinguishing media suitable for the material that is burning.

POTENTIAL HEALTH EFFECTS

PRIMARY ROUTE(S) OF ENTRY

Inhalation (breathing), eye and skin contact.

SYMPTOMS OF EXPOSURE

Skin Contact: Causes burns to abraded skin. Contact may cause depigmentation or sensitization.

Inhalation: Breathing vapors or mist may irritate the mucous membranes of the nose, throat, respiratory tract, and may cause headache, light-headedness, dizziness, and nausea.

Eye Contact: Causes eye burns.

Ingestion: Swallowing can cause gastrointestinal pain, cramps, nausea, vomiting, or central nervous system depression, and may cause kidney or liver damage; can cause life threatening asthma.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing skin disorders, eye problems, or impaired liver and kidney. Persons sensitized to sodium sulfite are at risk.

REPORTED AS CARCINOGEN OR POTENTIAL CARCINOGEN

✓ Not Applicable
_ OSHA Suspect Carcinogen
_ National Toxicology Program (NTP)
_ International Agency for Research on Cancer (IARC)

4. FIRST AID MEASURES

Skin contact: Wash affected areas with large amounts of running water, and soap if available, for 15 minutes. Remove contaminated clothing and shoes. Get immediate medical attention. Wash clothing and decontaminate shoes before reuse.

Inhalation: Remove from area to fresh air. If not breathing, clear airway and start mouth-to-mouth artificial respiration or use a bag- mask respirator. Get immediate medical attention. If victim is having trouble breathing, transport to medical care and, if available, give supplemental oxygen.

Eye contact: Immediately rinse eyes with water. Remove any contact lenses. Hold eyelids apart to ensure rinsing of the entire surface of the eyes and lids with water. Continue flushing eyes with large amounts of running water for at least 15 minutes. If physician is not available, flush for an additional 15 minutes. Get immediate medical attention

Ingestion: Give 3-4 glasses of water, but DO NOT induce vomiting. If vomiting occurs, give fluids again. Get medical attention to determine whether vomiting or evacuation of stomach is necessary. Do not give anything by mouth to an unconscious or convulsing person.

NOTE TO PHYSICIAN

None known.

5. FIRE FIGHTING MEASURES

Flash Point and Method . . . . . > 200 ˚F (PMCC)

GENERAL HAZARD

Fire or excessive heat may produce hazardous decomposition products.

EXTINGUISHING MEDIA

In case of fire use extinguishing media suitable for the material that is burning.

SPECIAL FIREFIGHTING INSTRUCTIONS

None known.

FIREFIGHTING EQUIPMENT

As in any fire, wear NIOSH approved, positive-pressure self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Wear appropriate protective equipment (See Section 8). Do not get in eyes, on skin, or on clothing. Ventilate area of leak or spill. Absorb with kitty litter, sand, or earth and package in a suitable container for disposal.

7. HANDLING AND STORAGE

HANDLING

Wear appropriate protective equipment (See Section 8). Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

STORAGE

Keep in tightly closed container, stored in a cool, dry, ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Use engineering controls to reduce air contamination to permissible exposure level.

PERSONAL PROTECTION

Respirator: In conditions where high concentrations of vapors are present or exposure limits are exceeded, wear a respirator that has been selected by technically qualified person for the specific work conditions.

Eye Protection: Wear approved safety goggles.

Gloves: Rubber (butyl, Neoprene).

Clothing: Wear long-sleeved clothing. Use rubber apron. Use rubber boots.

Other: Eye wash; safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

State . . . . . Liquid
Color . . . . . Light brown
Odor . . . . . Mild, sweet
Melting Point ˚F . . . . . N/A
Boiling Point ˚F . . . . . > 212
Specific Gravity @ 68˚F 1.315

Vapor Density (Air = 1) 0.6
Vapor Pressure (mm Hg) . . . . . N/A
pH 10.68
Water Solubility . . . . . Soluble
Solubility in other liquids . . . . . N/E

10. STABILITY AND REACTIVITY

REACTIVITY

Stable under normal use conditions. Will decompose in acid solutions, liberating toxic and irritating sulfur dioxide gas.

HAZARDOUS DECOMPOSITION PRODUCTS

CO_2, CO, and oxides of sulfur

INCOMPATIBILITIES

Acidic materials, strong oxidizers, metals and organic materials.

CONDITIONS TO AVOID

Excessive heat, acids.

11. TOXICOLOGICAL INFORMATION

The product is corrosive to abraded skin in a modified FHSA/CPSC Design, 16 CFR 1500 test procedure. It is not corrosive to intact skin.

For Diethylene glycol:

Oral LD_{50} (rat): 12,565 mg/kg
Oral LD_{50} (mouse): 23,700 mg/kg
Dermal LD_{50} (rabbit): 11,890 mg/kg

For Hydroquinone:

Oral LD_{50} (rat): 320 mg/kg
Oral LD_{50} (mouse): 245 mg/kg

For Sodium sulfite:

Oral LD_{50} Mouse: 820 mg/kg

For Potassium carbonate:

Oral LD_{50} (rat): 1,870 mg/kg
Oral LD_{50} (mouse): 2,570 mg/kg

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

For Diethylene glycol:

96 hr LC_{50} (fathead minnow): >100 mg/L. Cond: Static.
96 hr LC_{50}(water flea); 0.3-1.0 mg/L. Cond: Static.
15min EC_{50} (Photobacterium phosphoreum): 228 mg/L Microtox test.

For Hydroquinone:

96 hr LC_{50} (rainbow trout): 0.097 mg/L.
96 hr LC_{50} (fathead minnow): 0.1-0.18 mg/L.
48 hr EC_{50} (water flea): 0.05 mg/L.
30 min EC_{50} (Photobacterium phosphoreum): 0.0382 mg/L Mictotox test.

ENVIRONMENTAL MOVEMENT AND PARTITIONING

Not known.

ENVIRONMENTAL FATE

Not known.

13. DISPOSAL CONSIDERATIONS

RCRA Waste Code: . . . . . Not regulated.

14 TRANSPORT INFORMATION

DOT Hazard Class . . . . . Not Regulated

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200)

✓ Hazardous _ Non-Hazardous

CERCLA/SUPERFUND (40 CFR 117, 302)

Hydroquinone; RQ 100 lbs.

SARA EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355)

Hydroquinone TPQ 500 lbs.

INVENTORY STATUS

All ingredients of this product are on the TSCA inventory.

SARA HAZARD CATEGORIES (40 CFR 370)

✓ Acute ✓ Chronic _ Fire
_ Pressure _ Reactive _ None

SARA TOXIC CHEMICALS (40 CFR 372)

Hydroquinone <5%.

TSCA CHEMICAL SPECIFIC RULES

None known.

STATE REGULATIONS

Florida Hazardous Substance List . . . . Hydroquinone
Massachusetts Right To Know List . . . . Hydroquinone
Minnesota Hazardous Substance List . . Diethylene glycol and hydroquinone
New Jersey Right To Know List . . . . . Hydroquinone
Rhode Island Hazardous Substance List Hydroquinone, Diethylene glycol

16. OTHER INFORMATION

NFPA RATING

Health	3
Fire	1
Reactivity	0

ABBREVIATIONS

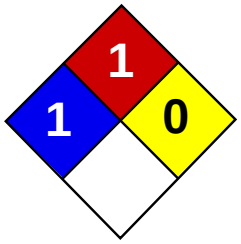
C - Ceiling limit
ERG - Emergency Response Guidebook
N/A - Not applicable
N/D - Not determined
N/E - Not established
N/K - Not known
RQ - Reportable Quantity
TPQ - Threshold Planning Quantity

PREPARATION INFORMATION

Prepared by: . . Sprint Systems of Photography, Inc.
Date Prepared: . May 10, 2003
Replaces: . . June 21, 2000

REVISION INFORMATION

Section 11 was updated to reflect results of a irritation study.
Section 14 was revised to take into account skin corrosion test results.



Health	1
Fire	1
Reactivity	0
Personal Protection	E

Material Safety Data Sheet

Ferric ammonium citrate, brown MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ferric ammonium citrate, brown

Catalog Codes: SLF1000

CAS#: 1185-57-5

RTECS: GE7540000

TSCA: TSCA 8(b) inventory: Ferric ammonium citrate

CI#: Not available.

Synonym: Ammonium Ferric Citrate; Ammonium iron (III) citrate; Iron (III) ammonium citrate; 1,2,3-Propanetricarboxylic acid, 2-hydroxy, ammonium iron (3+) salt

Chemical Name: Citric Acid, ammonium iron (3+) salt

Chemical Formula: This compound is a complex salt of undetermined structure, composed of Iron, Ammonia, and Citric Acid

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ferric ammonium citrate	1185-57-5	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (irritant). CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Skin Contact:
Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Slightly flammable to flammable in presence of open flames and sparks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available. Slightly explosive in presence of heat.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Toxic oxides of nitrogen or ammonia gas may be formed in fires.

Special Remarks on Explosion Hazards: Containers may explode when heated.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not breathe dust.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Sensitive to light. Store in light-resistant containers.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 1 STEL: 2 (mg(Fe)/m) [United Kingdom (UK)] TWA: 1 (mg(Fe)/m) from MSHA standardConsult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Solid powder. Deliquescent solid.)

Odor: Odorless.

Taste: Saline, Mild ferruginois taste

Molecular Weight: Not available.

Color: Brownish. Yellowish.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: 1.8 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in cold water. Solubility in water: 25 g/100 ml @ 20 deg. C. Practically insoluble in alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Excess heat, incompatible materials, light

Incompatibility with various substances: Not available.

Corrosivity: Not available.

Special Remarks on Reactivity:
Incompatible with iodides, acacia preparations, and tannins. Sensitive to light.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals:
Lethal Dose/Conc: LD [Rat] - Route: Oral; Dose: >2000 mg/kg

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Contact may cause irritation or rash, particularly with moist skin. Eyes: May cause eye irritation with redness, tearing, and abrasion. Inhalation: Inhalation of high concentrations of dust may cause nasal, throat or lung irritation. Symptoms may include coughing and wheezing. Ingestion: Ingestion can produce gastrointestinal tract irritation with hypermotility, diarrhea. Chronic Potential Health Effects: Eyes: Prolonged eye contact may cause a brownish discoloration of the eyes. Skin: Prolonged skin contact may cause skin irritation.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Ferric ammonium citrate Illinois chemical safety act: Ferric ammonium citrate New York release reporting list: Ferric ammonium citrate Pennsylvania RTK: Ferric ammonium citrate Massachusetts RTK: Ferric ammonium citrate Massachusetts spill list: Ferric ammonium citrate New Jersey: Ferric ammonium citrate New Jersey spill list: Ferric ammonium citrate Louisiana spill reporting: Ferric ammonium citrate TSCA 8(b) inventory: Ferric ammonium citrate CERCLA: Hazardous substances.: Ferric ammonium citrate: 1000 lbs. (453.6 kg)

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
This product is not classified according to the EU regulations. Not applicable.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 1

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 1

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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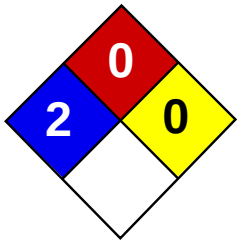

Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Potassium metabisulfite MSDS

Section 1: Chemical Product and Company Identification

Product Name: Potassium metabisulfite

Catalog Codes: SLP3214, SLP5026, SLP2203

CAS#: 16731-55-8

RTECS: TT4920000

TSCA: TSCA 8(b) inventory: Potassium metabisulfite

CI#: Not available.

Synonym: Dipotassium pyrosulfite; Dipotassium disulfite; Dipotassium metabisulfite; Potassium disulfite; Pyrosulfurous acid, dipotassium salt

Chemical Name: Potassium Pyrosulfite

Chemical Formula: K2-S2-O5

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Potassium metabisulfite	16731-55-8	100

Toxicological Data on Ingredients: Potassium metabisulfite LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation (lung irritant). Slightly hazardous in case of ingestion.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
When heated to decomposition it emits toxic fumes of sulfur oxides and potassium sulfate. It may ignite during milling or grinding (when powdering it).

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Section 7: Handling and Storage

Precautions:
Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline powder. Crystals solid.)

Odor: Sulfurous. Sulffur dioxide odor

Taste: Not available.

Molecular Weight: 222.31 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Decomposition temperature: 150°C (302°F)

Critical Temperature: Not available.

Specific Gravity: Density: 2.34 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 2.3 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in cold water, hot water. Soluble in acids and alkaline. Insoluble in alcohol

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, moisture, air

Incompatibility with various substances: Reactive with oxidizing agents, acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Liberates sulfur dioxide in contact with acids. Air sensitive. Moisture sensitive. It oxidizes to in air to sulfate, more readily in presence of moisture.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available. LC50: Not available.

Chronic Effects on Humans: CARCINOGENIC EFFECTS: 3 (Not classifiable for human.) by IARC.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of inhalation (lung irritant). Slightly hazardous in case of ingestion.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects based on animal test data. May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritation. Inhalation: May cause respiratory tract irritation. May cause asthmatic attacks due to allergic sensitization of the respiratory tract. Ingestion: May cause gastrointestinal tract irritation with abdominal pain, nausea, vomiting and diarrhea. May cause allergic/hypersensitivity/ anaphylactoid reaction. Some asthmatics are said to be sensitive to minute amounts of sulfites in foods. It may cause a worsening of asthma in asthmatics. Individuals sensitive to sulfides may experience stomach upset , tightness in the chest, or wheezing. Extremely large concentrations may produce central nervous system, seizures, hypotension, tachycardia, and cardiovascular collapse.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Potassium metabisulfite

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not yet classified under WHMIS (Canada)

DSCL (EEC):
R31- Contact with acids liberates toxic gas. R36/37/38- Irritating to eyes, respiratory system and skin. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S36- Wear suitable protective clothing.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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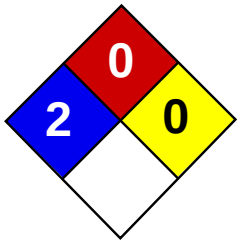

Health	2
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Potassium ferricyanide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Potassium ferricyanide

Catalog Codes: SLP4000, SLP1183

CAS#: 13746-66-2

RTECS: LJ8225000

TSCA: TSCA 8(b) inventory: Potassium ferricyanide

CI#: Not available.

Synonym: Potassium hexacyanoferrate (III)

Chemical Name: potassium ferricyanide

Chemical Formula: K3Fe(CN)6

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Potassium ferricyanide	13746-66-2	100

Toxicological Data on Ingredients: Potassium ferricyanide: ORAL (LD50): Acute: 2970 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as acids.

Storage:
Light sentisitve Store in light-resistant containers. Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (crystalline powder.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 329.25 g/mole

Color: Red.

pH (1% soln/water): Not available.

Boiling Point: Not available.

Melting Point: Decomposes.

Critical Temperature: Not available.

Specific Gravity: 1.85 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility: Soluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, light, incompatible materials.

Incompatibility with various substances: Reactive with acids.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Incompatible with ammonia, chromium trioxide + heat, sodium nitrite + heat, acids, and acid fumes. Sensitive to light. When heated to decompositon or comes in contact with acid or acid fumes, it emits toxic fumes of cyanides. It emits toxic fumes of cyanides, and oxides of nitrogen when heated to decompositon

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 2970 mg/kg [Mouse].

Chronic Effects on Humans: MUTAGENIC EFFECTS: Mutagenic for bacteria and/or yeast.

Other Toxic Effects on Humans:
Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Rat] - route: Oral; Dose: 1600 mg/kg

Special Remarks on Chronic Effects on Humans: May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: May cause eye irritaiton. Inhalation: May cause respiratory tract irritation with coughing and shortness of breath. Ingestion: May cause gastrointestinal tract irritation with nausea, vomiting, diarrhea, and possible abdominal cramping. Chronic Potential Health: Inhalation: Prolonged or repeated inhalation may affect blood and urinary system. The toxicological properties of this substance have not been fully investigated.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: CLASS 9: Miscellaneous hazardous material.

Identification: : Environmentally hazardous substances, solid, N.O.S.(Potassium Ferricyanide) UNNA: 3077 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Potassium ferricyanide

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):
R36/38- Irritating to eyes and skin. S2- Keep out of the reach of children. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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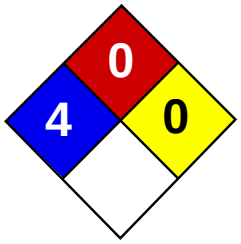

Health	4
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Potassium dichromate MSDS

Section 1: Chemical Product and Company Identification

Product Name: Potassium dichromate

Catalog Codes: SLP5455, SLP2629

CAS#: 7778-50-9

RTECS: HX7680000

TSCA: TSCA 8(b) inventory: Potassium dichromate

CI#: Not available.

Synonym: Bichromate of potash; Dipotassium Dichromate; Potassium bichromate; Potassium dichromate (VI)

Chemical Name: Not available.

Chemical Formula: K2Cr2O7

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Potassium dichromate	7778-50-9	100

Toxicological Data on Ingredients: Potassium dichromate LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:
Extremely hazardous in case of skin contact (permeator). Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, . Hazardous in case of skin contact (corrosive, sensitizer), of eye contact (corrosive), of inhalation (lung irritant). Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to blood, kidneys, lungs, liver, upper respiratory tract, skin, eyes. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. Cover the irritated skin with an emollient. If irritation persists, seek medical attention.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do not induce vomiting. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: combustible materials, organic materials

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Dangerous in contact with organic materials. Contact with combustible or organic materials may cause fire. When heated to decomposition it emits toxic fumes of potassium oxide

Special Remarks on Explosion Hazards: Reacts explosively with hydrazine, and anydrous hydroxylamine.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Oxidizing material. Stop leak if without risk. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material Do not breathe dust. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes Keep away from incompatibles such as reducing agents, combustible materials, organic materials.

Storage: Oxidizing materials should be stored in a separate safety storage cabinet or room.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 0.1 (mg(CrO3)/m) from OSHA (PEL) [United States] TWA: 0.05 (mg(Cr)/m) from ACGIH (TLV) [United States]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Odorless.

Taste: Bitter. metallic.

Molecular Weight: 294.2 g/mole

Color: Orange-Red.

pH (1% soln/water): 4 [Acidic.]

Boiling Point: Decomposition temperature: 500°C (932°F)

Melting Point: 398°C (748.4°F)

Critical Temperature: Not available.

Specific Gravity:
2.676 @ 25 deg. C(Water = 1) Bulk Density: 1.6 g/m3 @ 20 deg. C

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water.

Solubility:
Easily soluble in hot water. Soluble in cold water. Solubility in water: 4.9 g/100 ml water @ 0 deg. C Solubility in water: 10.5% (w/w) @ 20 deg. C Solubility in water: 102 g/100 ml water @ 100 deg. C Insoluble in alcohol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with reducing agents, combustible materials, organic materials, metals, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts violently or ignites with ethylene glycol above 100 deg. C Other Incompatibles: combustible, organic, or other readily oxidizable materials such as paper, wood, sulfur, aluminum, iron, tungsten, sulfuric acid + acetone, born, glycol, sulfur, plastics

Special Remarks on Corrosivity: Not available.

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
Acute oral toxicity (LD50): 25 mg/kg [Rat]. Acute dermal toxicity (LD50): 14 mg/kg [Rabbit].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: blood, kidneys, lungs, liver, upper respiratory tract, skin, eyes.

Other Toxic Effects on Humans:
Extremely hazardous in case of skin contact (permeator). Very hazardous in case of skin contact (irritant), of ingestion, . Hazardous in case of skin contact (corrosive, sensitizer), of eye contact (corrosive), of inhalation (lung irritant).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Dose: LDL [Man] - Route: Oral; Dose: 143 mg/kg LDL [Child] - Route: Oral; Dose 26 mg/kg

Special Remarks on Chronic Effects on Humans:
Passes through the placental barrier in animal. May cause adverse reproductive effects and birth defects (teratogenic). May affect genetic material (mutagenic)

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: It causes skin irritation and may cause skin burns. It can be absorbed by the skin and cause systemic effects. Deep ulceration of the skin of the hands, resulting from occupational exposure can penetrate as far as the bone in severe cases. Eyes: Causes eye irritation and may cause eye burns. It may cause severe damage with possible loss of vision, transient corneal bulging, residual irregular astigmatism, and anesthesia of the area after bulging resolves. Inhalation: Causes respiratory tract irritation. Inhalation of dust or mist can also cause irritation of the nose and eyes. Symptoms may include sneezing, rhinorrhea, throat erythema, nasal septum lesions, or perforation with with bleeding, disharge, or crusting Ingestion: Harmful if swallowed. When ingested in small amounts, it can cause burns of the esophagus, with possible stricture formation and perforation of the stomach. Symptoms may include adbominal and esophageal pain, nausea, vomiting, hypermotility, diarrhea, gastrointestinal tract irritation and bleeding, respiratory distress, cyanosis, coma, and death. It may also affect the cardiovascular system (cardiovascular shock, peripheral vascular collapse, urinary system (kidney

damage - nephritis with glycosuria, acute tubular necrosis, renal failure), liver (elevated liver enzyme levels, hepatits, hepatic failure), behavior/central nervous system/nervous system (somnolence, ataxia, vertigo, muscle cramps). It may also affect the blood and cause anemia, methemglobinemia (characterized by dizziness, drowsiness, headache, shortness of breath, cyanosis with bluish skin, rapid heart

Section 12: Ecological Information

Ecotoxicity:
Ecotoxicity in water (LC50): 75 mg/l 96 hours [Fish (Striped bass)]. 1.5 mg/l 24 hours [Daphnia (daphnia)]. 17.3 mg/l 11 hours [Fish (Fathead minnow)].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation:
Dangerous to aquatic life in high concentrations. Chromium probably occurs as the insoluble (CrIII) oxide (Cr2O3.nH2O) in the soil, as the organic matter in the soil is expected to reduce any soluble chromate to insoluble chromic oxide (Cr2O3). Chromium in the soil can be transported to the atmosphere by way of aerosol formation. Chromium is also transported from the soil through runoff and leaching of water. Most of the chromium in surface waters may be present in particulate from as sediment. Some of the particulate chromium would remain as suspended matter and ultimately be deposited in the sediments. Chromium present usually as (CrIII) in the soil and is characteriszed by its lack of mobility, except in cases where Cr(VI) is involved. Chromium (VI) of natural origin is rarely found.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification:
CLASS 5.1: Oxidizing material. CLASS 6.1: Poisonous material.

Identification: : Toxic Solids, Oxidizing, n.o.s (Potassium Dichromate) UNNA: 3086 PG: I

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Potassium dichromate California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Potassium dichromate Pennsylvania RTK: Potassium dichromate Massachusetts RTK: Potassium dichromate TSCA 8(b) inventory: Potassium dichromate SARA 313 toxic chemical notification and release reporting: Potassium dichromate CERCLA: Hazardous substances.: Potassium dichromate

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):

CLASS C: Oxidizing material. CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R21- Harmful in contact with skin. R25- Toxic if swallowed. R26- Very toxic by inhalation. R37/38- Irritating to respiratory system and skin. R41- Risk of serious damage to eyes. R43- May cause sensitization by skin contact. R46- May cause heritable genetic damage. R49- May cause cancer by inhalation. R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S53- Avoid exposure - obtain special instructions before use. S60- This material and its container must be disposed of as hazardous waste. S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

HMIS (U.S.A.):

Health Hazard: 4

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 4

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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