

The above sequence can be repeated if the negative is not sufficiently reduced.

For a general reduction of negative fog, dilute Working Solution A with an equal volume of water and use the above procedure.



PHOTOGRAPHERS' FORMULARY INC.

PO Box 950 • Condon MT 59826 • 406-754-2891 • FAX: 406-754-2896
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Cat. No. 05-0010

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FORMULARY REDUCER 1 FOR NEGATIVES

To make 1/2 liter of potassium ferricyanide solution and 2 liters of sodium thiosulfate (hypo) solution.

The chemicals in Reducer 1 are used to prepare two stock solutions. Depending on how the stock solutions are mixed and used, Reducer 1 can be used for either sub-proportional or proportional negative reduction. Sub-proportional reduction removes silver density from the low-density areas faster than from the high-density areas, thus increasing the negative's contrast. Proportional reduction removes silver density from all areas, thus improving overdeveloped negatives.

Using a reducer correctly is an art and requires experience. We strongly urge you to practice with this reducer using scrap negatives before attempting reduction of a negative of value.

CHEMICALS CONTAINED IN THIS KIT

Chemical	Amount
Potassium Ferricyanide	37.5 g
Sodium thiosulfate, anhydrous	370 g

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the chemical warnings on each package. None of the chemicals in Reducer 1 need special attention.

POTASSIUM FERRICYANIDE: In spite of the fact that this compound contains cyanide, it is not particularly toxic. The reason is that the cyanide groups are bound to the iron atom and are not free to act as a poison.

Consult with local sewer and water authorities regarding proper disposal of darkroom chemicals in your area.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WISH TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.



Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 1200. Standard must be consulted for specific requirements

U.S. Department of Labor

Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (as Used on Label and List)

Potassium Ferricyanide

Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

Section I

Manufacturers /Distributor Address Number Street City State and Zip Code

Columbus Chemical Industries

N4335 Temkin Rd

Columbus, WI 53925-0008

Emergency Telephone Number

CHEMTREC 1-800-424-9300

Telephone Number for Information

920-623-2140

Date Prepared

12-20-2004

Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	CAS #	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Potassium Ferricyanide	13746-66-2	Not available	Not available	Not available	>98%

Section III - Physical/Chemical Characteristics

Boiling Point	Not available	Specific Gravity (H ₂ O = 1)	Not Applicable
Vapor Pressure (mm Hg)	Not Available	Melting Point	Decomposes
Vapor Density (AIR = 1)	Not Available	Evaporation Rate (Butyl Acetate = 1)	Not Available

Solubility in Water

soluble

Appearance and Odor

Red crystalline powder

Section IV Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	LEL	UEL
Non Flammable		Not applicable	Not applicable

Extinguishing Media

Suitable to extinguish the supporting flame. Water spray, dry chemical, carbon dioxide, alcohol foam.

Special Fire Fighting Procedures

In the event of a fire, wear full protective clothing and NIOSH/MSHA-approved self-contained breathing apparatus

with full facepiece operated in the pressure demand or other positive pressure mode.

Unusual Fire and Explosion Hazards

DANGER! emits toxic fumes of cyanides under fire conditions.

Section V Reactivity Data

Stability	Unstable		Conditions to Avoid	Unknown
	Stable	X		

Incompatibility Materials to Avoid
acids, ammonia, light sensitive

Hazardous Decomposition or Byproducts

Cyanides, Nitrogen oxides

Hazardous Polymerization			Conditions to Avoid
	May Occur		Not Available
	Will Not Occur	X	

Section VI Health Hazard Data

Routes of Entry	Inhalation ?	Skin ?	Ingestion ?
Multiple	Yes	Yes	Yes

Health Hazards (Acute and Chronic)

EYES/SKIN: May cause irritation. INHALATION: Cause irritation of the mucous membranes and upper respiratory tract. INGESTION: May cause digestive tract irritation.

Carcinogenicity	NTP	IARC Monographs	OSHA REGULATED?
	Not Listed	Not Listed	Not Listed

Signs and Symptoms of Exposure.

Irritation, especially to mucous membranes of eyes and upper respiratory tract. Itching, redness, staining, swelling of exposed tissues, coughing, shortness of breath. Ingestion may cause gastrointestinal pain, diarrhea, nausea and

Medical Conditions Generally Aggravated by Exposure Not Available

Emergency and First Aid Procedures INGESTION: Wash out mouth with water provided person is conscious. Call a physician immediately. INHALATION: Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. SKIN: Flush with water for at least 15 minutes. Remove contaminated clothing; call a physician. EYES: Flush with large amounts of water for at least 15 minutes, lifting lower and upper eyelids.

Section VII Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled Evacuate unprotected personnel from area. Ventilate area. Wear self-contained breathing apparatus, rubber boots, heavy protective gloves and chemical safety goggles. Transfer into closed container. Ventilate and wash spill area when complete.

Waste Disposal Method Dispose of spillage, empty containers, and other materials used for clean up in accordance with all Federal, state, and local regulations.

Precautions to be Taken in Handling and Storing Store in a cool, dry, well-ventilated area in tightly-closed, plainly-labelled containers. Store in a resistant container. Protect against moisture, physical damage and light. Maintain adequate ventilation. Wash thoroughly after handling. Do not ingest or breathe vapors. Protect exposed tissues.

Other Precautions Containers, even when empty, will retain residue and vapors. Always obey hazard warnings and handle empty containers as if they were full.

Section VII Control Measures

Respiratory Protection (Specify Type) NIOSH/MSHA-approved respirator with dust/mist cartridge.

Ventilation	Local Exhaust	Required	Special	Eye wash station.
	Mechanical (General)	Recommended.	Other	Safety Shower.

Protective Gloves Appropriate Chemical Resistant Eye Protection Chemical Safety Goggles

Other Protective Clothing or Equipment Rubber apron, boots.

Work /Hygienic Practices Do NOT wear contact lenses. Wash thoroughly after handling. Avoid eye and skin contact.

Avoid breathing vapors. Follow safe handling and laboratory practices. Wash hands prior to eating or smoking.

Avoid prolonged or repeated contact.

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PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

Distribution:

UNIVAR

17425 NE Union Hill Road

Redmond WA 98052

FOR EMERGENCY IN USA, CALL CHEMTEC: 800-424-9300

(24 Hours/Day, 7 Days/Week)

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Sodium thiosulfate	7772-98-7	>99 (anhydrous)
Sodium thiosulfate pentahydrate	10102-17-7	>99 (pentahydrate)

Trace impurities and additional material names not listed above may appear in Section 15 of this MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

OSHA Hazard Communication Standard: This product is considered hazardous under the OSHA Hazard Communication Standard.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Odorless, clear to white crystals or granules which may irritate the skin and respiratory tract. May cause irritation and/or burns to the eyes. Reacts with acids to form toxic and irritating sulfur dioxide gas and/or hydrogen sulfide gas. Not flammable.

POTENTIAL HEALTH HAZARDS

SKIN: Dust, solutions or mist may cause skin irritation from repeated or prolonged contact.

EYES: Dust, solutions or mist may irritate or burn the eyes and cause temporary conjunctivitis.

INHALATION: Inhalation of product dust or mist may irritate the respiratory tract. Contact with acids releases sulfur dioxide and/or hydrogen sulfide gas which may be harmful or deadly if inhaled.

INGESTION: Ingestion may cause irritation of the gastrointestinal tract and purging, if a large quantity is ingested. Relatively low in acute toxicity.

DELAYED EFFECTS: None known.

Ingredients found on one of the three OSHA designated carcinogen lists are

REPORT NUMBER: 703

UNIVAR USA INC.

PAGE: 001

MSDS NO: 67671

MATERIAL SAFETY DATA SHEET

MAINFRAME UPLOAD DATE: 05/16/06

VERSION: 001

10-1360 - 1370

PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

PHOTOGRAPHERS FORMULARY
CALL IN ADVANCE TO MEET
HOLD ON REDDAWAY DOCK
7180 KESTREL DRIVE
MISSOULA ,MT 59808

UNIVAR USA INC.

(425)889-3400

17425 NE UNION HILL RD , REDMOND

, WA 98052

----- EMERGENCY ASSISTANCE -----

FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL - CHEMTREC
(800)424-9300

PRODUCT NAME: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

MSDS NUMBER: 67671

DATE ISSUED: 09/01/2004

SUPERSEDES: NEW

ISSUED BY: 001487

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAMES:
SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

OTHER/GENERIC NAMES: Sodium Thiosulfate Anhydrous, Sodium Hyposulfite;
"hypo"; Sodium Thiosulfate Crystal; Prismatic Rice

PRODUCT USE: Photo processing, water treatment, waste treatment, paper
manufacture, other industrial processes.

PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

IN CASE OF SPILL OR OTHER RELEASE: (See section 8 for recommended personal protective equipment.) Promptly shovel or sweep up material with minimum dusting and shovel into an empty container with a cover. Cautiously spray residue with plenty of water.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (See section 8 for recommended personal protective equipment.)

Avoid contact with skin, eyes and clothing. Do not breathe dust or mist. Use with adequate ventilation. Wash thoroughly after handling.

If dissolving and mixing solutions: with anhydrous material, the reaction is exothermic and the solution will retain heat; with the hydrate (crystal) material, the reaction is endothermic and the solution will cool.

STORAGE RECOMMENDATIONS:

Store in a cool, dry, well-ventilated area away from acids and oxidizing agents. Keep container closed when not in use and protect from physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local exhaust if dusty or misty conditions exist or if there is a release of sulfur dioxide and/or hydrogen sulfide gas. Keep incompatible materials out of hoods, ducts, etc.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION: For handling dry material, wear cotton gloves and full work clothing, including long-sleeved shirt and trousers. When handling solutions, wear impervious gloves and an apron. If contact with the solution is repeated and/or prolonged, wear full impervious clothing.

EYE PROTECTION: Wear a hard hat (or other head covering) and chemical safety glasses/goggles. Do not wear contact lenses.

RESPIRATORY PROTECTION: Where required, use a NIOSH-approved respirator for dust, mist, sulfur dioxide and/or hydrogen sulfide gas, as conditions indicate. If sulfur dioxide and/or hydrogen sulfide gas should be released, use a NIOSH-approved self-contained breathing apparatus or supplied-air respirator.

PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST No
ingredients listed in this section.			

4. FIRST AID MEASURES

SKIN: Wash skin with plenty of soap and water. Remove contaminated clothing and wash before reuse. Get medical attention if irritation persists.

EYES: Flush eyes immediately with water for at least 15 minutes. Get medical attention if irritation persists.

INHALATION: Promptly remove to fresh air. If breathing is difficult, give oxygen, provided a qualified operator is available. If symptoms persist, get medical attention.

INGESTION: If conscious, immediately give 2 to 4 glasses of water and induce vomiting by touching finger to back of throat. If irritation persists, get medical attention.

ADVICE TO PHYSICIAN: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not flammable
FLASH POINT METHOD:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT (volume % in air):	Not applicable
LOWER FLAME LIMIT (volume % in air):	Not applicable
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Material is not flammable. Use extinguishing media appropriate for material in surrounding fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Wear NIOSH-approved self-contained breathing apparatus to protect against any release of toxic and/or irritating fumes. Skin and eye protection should also be provided. Use water-spray to keep fire-exposed containers cool, and to knock down fumes.

6. ACCIDENTAL RELEASE MEASURES

PRODUCT: SODIUM THIOSULFATE ANHYDRUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

Strong oxidizers: causes vigorous exothermic reactions.
Acids: releases sulfur dioxide and/or hydrogen sulfide gas.

HAZARDOUS DECOMPOSITION PRODUCTS:

Sulfur dioxide gas, hydrogen sulfide gas and sodium sulfide residue.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Data not available.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Data not available.

OTHER DATA:

None.

12. ECOLOGICAL INFORMATION

Data not available.

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? No If yes, the RCRA ID number is: Not applicable.

OTHER DISPOSAL CONSIDERATIONS:

Dispose of in accordance with applicable Federal, State and Local regulations.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not regulated.
US DOT ID NUMBER: Not applicable.
PROPER SHIPPING NAME: Not applicable.

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

ADDITIONAL RECOMMENDATIONS: Eyewash and safety shower are recommended.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
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No ingredients listed in this section.

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Sulfur dioxide: OSHA TWA = 5 ppm;

ACGIH TLV = 2 ppm;

ACGIH STEL = 5 ppm.

Hydrogen sulfide:

OSHA Ceiling = 20 ppm;

ACGIH TLV = 10 ppm;

ACGIH STEL = 15 ppm.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear to White granules or crystals.

PHYSICAL STATE: Solid.

MOLECULAR WEIGHT: 158.11 (anhydrous)

248.18 (pentahydrate)

CHEMICAL FORMULA: Na₂S₂O₃ (anhydrous)

HYDRATED FORMULA: Na₂S₂O₃ 5H₂O (pentahydrate)

ODOR: Odorless.

SPECIFIC GRAVITY (water = 1.0): 1.667 (anhydrous)

1.685 (pentahydrate)

SOLUBILITY IN WATER (weight = 1.0): 33 @ 0 deg. C (anhydrous)

32 @ 0 deg. C (pentahydrate)

pH: -8.6 (7.5% solution; anhydrous)

BOILING POINT: Not applicable.

MELTING POINT: 48 deg C (pentahydrate)

VAPOR PRESSURE: Not applicable.

VAPOR DENSITY (air = 1.0): Not applicable.

EVAPORATION RATE: Not applicable. COMPARED TO:
Not applicable.

% VOLATILES: Not applicable.

FLASH POINT: Not flammable.

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Normally stable.

INCOMPATIBILITIES:

PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376
PROD NO : 743056

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: All components are listed on TSCA Inventory of Chemical Substances.

OTHER TSCA ISSUES: None.

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
No ingredients listed in this section.		

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-6802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate.

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals" and may be subject to annual reporting requirements. CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
No ingredients listed in this section.	

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT
No ingredients listed in this section.		

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

02B

FOREIGN CHEMICAL CONTROL INVENTORY STATUS:

Listed on Canadian DSL and EU EINECS.

OTHER INFORMATION: This product is not for food or drug use.

PRODUCT: SODIUM THIOSULFATE ANHYDROUS AND SODIUM THIOSULFATE PENTAHYDRATE

ORDER NO: 248376

PROD NO : 743056

----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR UNIVAR USA INC.
DURING BUSINESS HOURS, PACIFIC TIME (425)889-3400

01/26/07 13:36 PRODUCT: 743056 CUST NO: 113365 ORDER NO: 248376

----- NOTICE -----

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