PHOTOGRAPHERS' FORMULARY SAFETY BULLETIN: SULFIDES

Sulfides of different kinds are used in photography, with sodium sulfide and polysulfide most often used in toning processes. We need to be aware of three particular areas of risk with sulfides. They may be dangerous as caustic solids or liquids, or as a very poisonous gas, and the fumes will fog photosensitive emulsions.

A solution of sulfide will dissolve flesh, and if allowed to contact the eye, blindness may result. A very small dry particle of sulfide will, upon reaching the eye, immediately form a concentrated solution with body fluids.

IF SULFIDES IN ANY FORM SHOULD CONTACT THE EYE IMMEDIATELY PLACE YOUR EYE UNDER RUNNING WATER FOR 5 TO 10 MINUTES. Don't waste time calling for help or looking for eyewashes. Administer first aid at once and then call a physician. Time is all-important.

It is always prudent to dissolve caustics in cold water, as considerable heat may be produced. It is as well, when making concentrated solutions, to dissolve the sulfide a bit at a time or to use ice water.

The fumes of sulfide solution are very noxious, but when a sulfide contacts an acid, the gas generated by the reaction is not only evil-smelling, it is an exceptionally powerful poison. The gas, hydrogen sulfide, is as active as hydrogen cyanide, and should be treated with equal respect. The only safe way to work with this gas is under near-ideal conditions, so it is essential that acids and sulfides not be allowed to contact each other in significant quantities. Dispose of spent solutions in a working drain with copious amounts of water. Never allow a sulfide to follow an acid into a drain, or vice-versa. To do so will allow the poisonous gas to be generated in the sewer, and to be backed-up into the home. Promptly clean up any sulfide or acid spilled to avoid accidental contact.

We recommend the use of goggles when using sulfides or caustics of any sort. With reasonable precautions sulfides may be safely and profitably used, as they have been for many generations.

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FORMULARY RESIDUAL SILVER TEST

Directions for mixing and using FORMULARY RESIDUAL SILVER TEST, kit size 125 ml

The Residual Silver Test is used to determine if any silver ions remain in a print or a filmstrip after fixing. When the test solution is applied to photographic material, the sulfide ions in the solution react with any residual silver ions in the material forming a yellow stain indicating the fixing process is inadequate.

CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read in chemical warning on the package of sodium sulfide in this kit.

Sodium sulfide is not sodium sulfite. Sodium sulfite, a preservative used in almost all photographic developers, is considered to be a bland chemical. Sodium sulfide is a powerful photographic fogging agent and is used mainly in toning baths. It is considered to be a dangerous chemical if it is used incorrectly.

Even though a very small amount of sodium sulfide is used in the mixing of Residual silver Test, it should be treated with considerable care. Do not allow it to come into contact with acid or any acidic solutions, such as a stop bath or fixer solution.

Sodium sulfide (as a solid or in solution) will react with acid to form hydrogen sulfide (H_2S) a foul smelling and poisonous gas.

Solid sodium sulfide is caustic. Do not allow it to come into contact with the skin because it can cause a chemical burn.

10-1330

UNIVAR USA
6100 Carillon Point
Kirkland WA 98033
425-889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

MSDS Number:PZ97636 MSDS Version:003

003 02/22/02 SODIUM SULFIDE

PRODUCT NAME: SODIUM SULFIDE
MSDS#: PZ97636
DATE ISSUED: 12/12/01
SUPERSEDES: 09/17/99
ISSUED BY: 008812

1. CHEMICAL PRODUCT

SYNONYMS: Sodium Menosulfide; Sulfur Compounds; Na2S

2. COMPOSITION7INFORMATION ON INGREDIENTS

Material/CAS Number Percent

Sodium Sulfide 59-62
1313-82-2

(Hydrated -- 38% water of crystallization)

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER! Contact with acid and excessive heat liberates flammable and poisonous Hydrogen sulfide gas. Corrosive - Causes severe burns to eyes and skin.

Precautions: Avoid contact with any acids or acidic materials. Forms poisonous gas, hydrogen sulfide (rotten egg odor), which also can cause fires and explosions. Breathing this gas can cause immediate death. The sense of smell becomes rapidly fatigued and cannot be relied upon to warn of the continuous presence of hydrogen sulfide gas. Do not get in eyes, on skin, or on clothing. May cause severe burns and permanent damage. Do not breathe dust or mists from solutions. Use only with adequate ventilation. Ventilation must be sufficient to minimize employee exposure to this product. Do not swallow. Wash thoroughly after handling. Do not eat, drink or smoke in work area.

4. FIRST AID MEASURES

INHALATION: Hydrogen sulfide has a characteristic "rotten egg" odor. Remove From area to fresh air. Contact a poison control center, emergency room Or physician right away as further treatment will be necessary.

EYE/SKIN CONTACT: EYE: Remove contact lens and pour a gentle stream of warm Water through the affected eye for at least 15 minutes. Contact a poison Control center, emergency room or physician right away as further treatment Will be necessary. SKIN: Run a gentle stream of water over the affected Area for 15 minutes. A mild soap may be used if available. Contact a Poison control center, emergency room or physician right away as further Treatment will be necessary.

INGESTION: Gently wipe or rinse the inside of the mouth with water. Sips of Water may be given if person is fully conscious. Never give anything by Mouth to an unconscious or convulsing person. Do not induce vomiting. Contact A poison control center, emergency room or physician right away as further Treatment will be necessary.

5. FIRE FIGHTING MEASURES

FLASH POINT: Non-flammable

EXTINGUISHING MEDIA: Not applicable.

SPECIAL FIREFIGHTING PROCEDURES: Contact with all acids or excessive heat will liberate poisonous, flammable hydrogen sulfide gas. Fire-fighters must wear NIOSH approved, pressure demand, self-contained breathing apparatus with full face piece for possible exposure to hazardous gases. Hydrogen sulfide vapors are heavier than air and may travel a considerable distance to source of ignition and flash back. The autoignition temperature of hydrogen sulfide is 500 deg F (260 deg C).

6. ACCIDENTAL RELEASE MEASURES

ACTION TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Immediately evacuate the area. Remove sources of ignition. Provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and eye/skin protection should be permitted in the area. Carefully shovel or sweep up spilled material and place into closed containers. Spilled material should be reclaimed if possible. Product must not come in contact with acids. After all visible traces have been removed, thoroughly wet vacuum the area. Do not flush to sewer. At the first sign of a hydrogen sulfide leak, a planned emergency program should be put into operation. Emergency drills should be made periodically. If a hydrogen sulfide leak occurs, all persons must promptly leave the area. A wind sock or other wind direction indicator should be within sight. Move crossways to the wind from the contaminated area. Insure that the entire area is evacuated. Only persons wearing NIOSH approved self-contained breathing apparatus or Full face piece airline respirators with auxiliary SCBA's operated in the Pressure/demand mode and eye/skin protection should be permitted in area. Each hydrogen sulfide leak should be dealt with immediately. Lead acetate Strips or portable monitoring instruments can be used to locate a hydrogen Sulfide leak. If hydrogen sulfide is leaking, the lead acetate paper will Turn brown. When working on a leak, employees should take a position so That escaping hydrogen sulfide moves away from them. Supplied air Equipment must be working no matter how small the leak.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORAGE:

Store away from strong oxidizing agents. Do not allow contact with acids and excessive heat. Will liberate poisonous, flammable hydrogen sulfide gas. Do not store in zinc, aluminum or copper containers. Wear respiratory protection whenever exposure to vapor is likely. Wear appropriate personal protective equipment. Store in a cool, dry, well-ventilated place. Store only in closed, properly labeled containers. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:
8-hour Time Weighted Average (TWA); 15-minute Short-Term Exposure Limit (STEL)

OSHA: No occupational exposure limits have been established by OSHA for this product. The OSHA exposure limit for hydrogen sulfide is 10 ppm TWA, 15 ppm STEL, 29 CFR 1910.1000, Rev. 3/1/89; the currently enforceable 1971 limit is 20 ppm ceiling.

ACGIH: No occupational exposure limits have been established by ACGIH for this Product. The ACGIH TWA for hydrogen sulfide is 10 ppm, and the STEL is 15 ppm.

Vendor (IPEL): No occupational exposure limits have been established by the vendor for this product. The Vendor IPEL for hydrogen sulfide is 10 ppm TWA, 15 ppm STEL.

RESPIRATORY PROTECTION: If exposure of hydrogen sulfide gas could exceed the exposure limits, use NIOSH approved full face airline and/or self-contained breathing apparatus operated in a positive pressure demand mode. The respiratory use limitations made by NIOSH or the manufacturer must be observed. Respiratory protection programs must be in accordance with 29 CFR 1910.134.

NOTE: Since the most critical hazard in working with this product is Exposure to hydrogen sulfide gas, Vendor recommends you consider the Installation of a continuous monitoring hydrogen sulfide gas detection and

Alarm system in any area where hazardous levels of hydrogen sulfide gas May occur. This safety measure has been recommended by NIOSH (National Institute for Occupational Safety and Health) in its publication entitled, "Criteria for a Recommended Standard...Occupational Exposure to Hydrogen Sulfide," U.S. May, 1977, publication No, DHEW (NIOSH) 77-158. Details Pertaining to training are outlined in this NIOSH publication.

VENTILATION: Use local exhaust or general room/dilution ventilation as appropriate to control employee exposures in the work place.

EYE AND FACE PROTECTION: Close fitting chemical safety goggles with faceshield.

PROTECTIVE GLOVES: Impervious or rubber gloves.

OTHER PROTECTIVE EQUIPMENT: Boots, aprons, or chemical suits should be used When necessary to prevent skin contact. Personal protective clothing and use of equipment must be in accordance with 29 CFR 1910.132 (general requirements), .133 (eye and face protection), and .138 (hand protection).

9. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 346 deg F
VAPOR DENSITY (Air=1): NA
SPECIFIC GRAVITY (Water=1): 1.858 (flake)
pH: Strongly alkaline
FREEZING/MELTING POINT: 92 deg C (197 deg F)
SOLUBILITY (wt.% in water): 15% @ 68 deg F
BULK DENSITY: 40 lbs/cu.ft. (flake)
VOLUME % VOLATILE: Very low
VAPOR PRESSURE: Unknown
EVAPORATION RATE: NA
HEAT OF SOLUTION: Mildly exothermic
PHYSICAL STATE: Flakes
ODOR: Slight rotten egg.
COLOR: White to yellow.

10. STABILITY AND REACTIVITY

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITY (CONDITIONS/MATERIALS TO AVOID):
Avoid contact with strong oxidizing agents and acids. Avoid concentrating solutions, could cause spontaneous ignition. Solutions attack zinc, copper, aluminum and alloys of these metals. Avoid heat, flames, sparks and other sources of ignition.

HAZARDOUS THERMAL DECOMPOSITION/COMBUSTION PRODUCTS:
Oxides of sulfur. Oxides of sodium. Hydrogen sulfide.

11. TOXICOLOGICAL INFORMATION

ACUTE INHALATION LC50: Unknown
ACUTE DERMAL LD50: 177.8 mg/kg. (rabbit) High toxicity.
SKIN IRRITATION: Corrosive.
EYE IRRITATION: Corrosive.
ACUTE ORAL LD50: 200 mg/kg. (rat) High toxicity.

CHRONIC EFFECTSICARCINOGENICITY: This product is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

MEDICAL CONDITIONS AGGRAVATED: None known.

EFFECTS OF OVEREXPOSURE:

ACUTE:
Irritation of mucous membranes, eyes, and respiratory tract is possible following exposure to the decomposition product, hydrogen sulfide gas, which is potentially lethal.
Ingestion: This material is quite corrosive and would produce burns of the Stomach lining capable of causing severe injury and death.

Eye/Skin: May cause irritation, severe burns and corrosion to the skin. This Material may be absorbed through the skin producing toxicity typical of Hydrogen sulfide poisoning. This product has similar effects as alkalies Following direct exposure to the eye and can cause lacrimation, sensitivity To light, tearing and irreversible damage, including blindness.

Hydrogen sulfide is a toxic and irritant gas whose effects are exerted on The respiratory system, gastrointestinal tract, eyes and central nervous System. Acute effects on the respiratory system, in order of increasing Severity, can be a runny nose with anosmia (loss of sense of smell), Tracheobronchitis with pain, cough, pulmonary edema with dyspnea (shortness Of breath), delayed bronchopneumonia, respiratory paralysis and terminal Asphyxial convulsion. Acute effects may occur without warning as a result Of olfactory fatigue. While the odor of hydrogen sulfide is distinct at 0.3 Ppm, olfactory fatigue occurs rapidly with continuous inhalation. Gastrointestinal effects can be profuse salivation, nausea, vomiting, vertigo, Amnesia, confusion and unconsciousness. Eye irritation of the conjunctiva With photophobia to severe conjunctivitis with keratitis. A possible Warning sign of eye exposure is the appearance of halos around light sources And increased sensitivity to light.

Note: The test data from rabbit studies demonstrate that this material has a dermal LD50 below 200 mg/kg. However, the extreme irritation experienced by skin contact precludes the likelihood that exposure to amounts sufficient to cause human illness would be encountered. vendor, therefore, considers that the irritating properties of this material and the long history of safe use obviates the need to label it a poison.

CHRONIC: The effects of long-term, low level exposures to this product have not been determined. Safe handling of this material on a long-term basis should emphasize the prevention of all contact with this material to avoid any effects from repetitive acute exposures.

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:
Toxic to aquatic life. 61 ppm (Bluegill Sunfish) 48-hour TLM LC50

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:
Dispose of in an approved hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, as well as any other relevant Federal, State, or local laws/regulations regarding disposal.

14. TRANSPORT INFORMATION

Proper Shipping Name: Sodium Sulfide, Hydrated
Hazard Class: 8 (Corrosive)
Identification Number: UN1849
Packing Group: II

15. REGULATORY INFORMATION

USA TSCA: This product is listed on the TSCA Inventory.
EUROPE EINECS: This product is listed on EINECS. (215-211-5)
CANADA DSL: This product is listed on the Canadian DSL.
AUSTRALIA AICS: This product is listed on AICS.
KOREA ECL: This product is listed on ECL.
JAPAN MITI (ENCS): This product is listed on MITI
PHILIPPINES PICCS: This product is listed on the Philippines Inventory of Chemicals and Chemical Substances (PICCS)

SARA TITLE III:
SARA (311, 312) Hazard Class:
Acute Health Hazard. Reactive Hazard.
SARA (313) Chemicals:

Not listed.

SARA Section 302:

Not listed as an Extremely Hazardous Substance.

CANADA REGULATIONS (WHMIS): Class E - Corrosive Material. Class D1A-Very Toxic Materials. Product use: Chemical processing. Odor Threshold: 1-5 Ppm for hydrogen sulfide.

HAZARD RATING SYSTEM (HMIS/NFPA):

NFPA: Health 3, Flammability 1, Reactivity 1

16. OTHER INFORMATION

NA = Not Available

For Additional Information:
Contact: MSDS Coordinator - Vopak USA
During business hours, Pacific Time - (425) 889-3400

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