



Material Safety Data Sheet

Ammonium sulfide solution

MSDS Number 6000 (Revised:1/25/2011)

6 Pages

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

- 1.1 **Product Name** **Ammonium sulfide solution**
 Chemical Family Inorganic salt solution
 Synonyms Ammonium hydrogen sulfide, ammonium sulfhydrate
 ammonium bisulfide, diammonium sulfide, ammonium
 hydrosulfide, ammonium mercaptan (KI-310)
 Formula (NH₄)₂S
- 1.2 **Manufacturer** Tessenderlo Kerley Inc.
 2255 N. 44th Street, Suite 300
 Phoenix, Arizona 85008-3279
 Information (602) 889-8300
- 1.3 **Emergency Contact** (800) 877-1737 (Tessenderlo Kerley)
(800) 424-9300 (CHEMTREC)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

- 2.1 **Chemical Ingredients (% by wt.)**
 Ammonium sulfide CAS #:12135-76-1 40-55% (Typical)
 Water CAS #:7732-18-5 45-60%

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 4 Flammability - 3 Reactivity - 1

EMERGENCY OVERVIEW

Warning: Severe inhalation hazard.
 Avoid inhalation of product fumes near openings on storage container.
 Upon release of product solution to the environment ammonia and hydrogen sulfide vapors will evolve. Both of these gases are highly toxic. Product solution is alkaline and corrosive to the skin.
 Eye contact will cause severe eye irritation and possible corneal damage.
 Ingestion will result in corrosion of tissues of the gastrointestinal tract.

Section	3:	HAZARDS IDENTIFICATION, Cont.
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3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes by product mist or solution will cause irritation and a burning sensation. Eye contact may result in severe corneal injury.

SKIN CONTACT: Contact with product mist or solution will cause skin irritation and may result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion of product solution will cause burning and corrosion of the mouth, throat and gastrointestinal tract to include nausea, vomiting and diarrhea. Contact with stomach acid will cause highly toxic hydrogen sulfide to evolve.

INHALATION: Inhalation of product vapors (ammonia and hydrogen sulfide) will cause dizziness and unconsciousness possibly resulting in serious falls from elevated positions. Continued exposure to these gases will cause severe lacrimation and respiratory difficulties and may lead to death.

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section	4:	FIRST AID MEASURES
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4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye and lids. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention.

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give large quantities of water. If vomiting does occur, continue to give fluids. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section	5:	FIRE FIGHTING MEASURES
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5.1 FLAMMABLE PROPERTIES

FLASH POINT: 71.6° F (22° C) **METHOD USED:** PMCC

5.2 FLAMMABLE LIMITS

H ₂ S	LFL: 4%	UFL: 44%
NH ₃	LFL: 15%	UFL: 28%

5.3 EXTINGUISHING MEDIA: Water spray or foam.

Section	5:	FIRE FIGHTING MEASURES (Cont.)
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5.4 FIRE & EXPLOSIVE HAZARDS: .When heated or diluted, ammonia vapors and hydrogen sulfide vapors will evolve. Both of these gases may form explosive mixtures with air. (See Section 5.2) Keep containers/storage vessels in fire area cooled with water spray. If the vapors venting from a vessel are burning, they should be permitted to continue to burn until the source of ignition has been extinguished. Water spray is very effective in “washing” venting vapors from the air.

Ammonium sulfide solutions do not support a continuous pooling liquid fire. The released vapors will flash off, then have to build again in concentration for an outside ignition source to re-ignite the vapors.

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section	6:	ACCIDENTAL RELEASE MEASURES
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6.1 Small releases: Wear full personal protective equipment. Confine and absorb small releases on sand, earth or other inert absorbent. Released material may contain residual sulfides. Spray with weak (~5%) hydrogen peroxide to oxidize sulfides.

6.2 Large releases: Wear full personal protective equipment. Confine area to qualified personnel. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (possible explosive mixtures) or surface waterways (potential aquatic toxicity). Spray product vapors with water spray or mist. Recover as much of the solution as possible. Treat remaining material as a small release (above).

Section	7:	HANDLING and STORAGE
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7.1 Handling: Handle in enclosed containers to avoid breathing product. Avoid contact with skin and eyes. Dilute only in enclosed containers. Use in a well ventilated area. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas in enclosed containers. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [$<90^{\circ}\text{F}$ (32°C)]. (See Section 10.4 for materials of construction)

Section	8:	EXPOSURE CONTROLS, PERSONAL PROTECTION
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8.1 RESPIRATORY PROTECTION: Wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Gloves, boots, and chemical suit should be worn to prevent liquid contact. Wash contaminated clothing prior to reuse. Contaminated shoes cannot be cleaned and should be discarded

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES: OSHA ACGIH

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION, Cont.

	<u>TWA</u>	<u>STEL</u>	<u>TLV</u>	<u>STEL</u>
Ammonia	25 ppm	35 ppm	25 ppm	35 ppm
Hydrogen sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

- 9.1 **APPEARANCE:** Green to reddish yellow liquid
- 9.2 **ODOR:** Rotten egg odor.
- 9.3 **BOILING POINT:** 104 °F(40 °C)
- 9.4 **VAPOR PRESSURE:** 450 mm Hg @ 68 °F (20 °C)
- 9.5 **VAPOR DENSITY:** Not determined
- 9.6 **SOLUBILITY IN WATER:** Complete
- 9.7 **SPECIFIC GRAVITY:** 0.975-1.05 (8.12-8.75 lbs/gal)
- 9.8 **FREEZING POINT:** 0° - 10° F (-17.8° - -12° C)
- 9.9 **pH:** 9.5-10.5 (Typical)
- 9.10 **VOLATILE:** Not applicable

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating this product will evolve ammonia and hydrogen sulfide vapors. Continued heating will also cause oxides of nitrogen and sulfur to be released.

10.4 INCOMPATIBILITY: Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness. Acids will cause the release of hydrogen sulfide, a highly toxic gas and ammonia. Alkalies will accelerate the evolution of ammonia. Ammonium sulfide is not compatible with copper, zinc or their alloys (i.e. bronze, brass, galvanized metals, etc.). These materials of construction should not be used in handling systems or storage containers for this product. (SEE Section 7.2, Storage)

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Interperitoneal- Mouse LD_{LO}: 10 mg/Kg (ammonium sulfide)
Oral-Mouse LD_{LO}: 80 mg/Kg (ammonium sulfide)

11.2 DERMAL: Skin-Mouse LD₅₀: 132 mg/Kg (ammonium sulfide)
Skin-Rabbit LD_{LO}: 119 mg/Kg (ammonium sulfide)

Section 11: TOXICOLOGICAL INFORMATION, Cont.

11.3 INHALATION: Data not available

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

100 ppm/ 72 hour/ goldfish/ killed/ fresh water
248 ppm/ 48 hour/ mosquito fish/ TI_m / fresh water

Section 13: DISPOSAL CONSIDERATIONS

This product meets the definition of a D001 and D003 hazardous waste in accordance with 40 CFR 261, Subpart C.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name: Ammonium sulfide solution

14.2 DOT Hazard Class: 8 (6.1 and 3 subsidiary)

14.3 UN/NA Number: UN2683

14.4 Packing Group: II

14.5 DOT Placard: Corrosive

14.6 DOT Label(s): Corrosive, poison, flammable

14.7 IMO Shipping Name: Ammonium sulphide solution

14.8 RQ (Reportable Quantity): 100 lbs (100%) (27 gal of product @ 45%.)

14.9 RR STCC Number: 28-191-64

Section 15: REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III: a. EHS (Extremely Hazardous Substance) List: No

Section 15: REGULATORY INFORMATION (Cont.)

b. Section 311/312, (Tier I,II) Categories: Immediate (acute) Yes
Fire Yes
Sudden release No
Reactivity Yes
Delayed (chronic) No

c. Section 313 (Toxic Release Reporting-Form R): Yes

<u>Chemical Name</u>	<u>CAS Number</u>	<u>Concentration</u>
Ammonia	7664-41-7	22.5%

d. TPQ (Threshold Planning Quantity): No

15.3 CERCLA/SUPERFUND: RQ (Reportable Quantity) Yes
100 lbs(45.4 Kg)

15.4 TSCA (Toxic Substance Control Act) Inventory List: Yes

15.5 RCRA (Resource Conservation and Recovery Act) Status: Yes
D001, D003

15.6 WHMIS (Canada) Hazard Classification: E, D2A, B2

15.7 DOT Hazardous Material: (See Section 14) Yes

15.8 CAA Hazardous Air Pollutant (HAP) No

Section 16: OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993, by Technical Services-Tessengerlo Kerley, Inc.

Address updated, 5/3/99
Revised Section 8.3, Eye Protection and revised Logo
Revised Sections 2.1, 9.7, and 9.9, 8/6/08.
Revised Section 5.4, 1/25/2011

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