

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFIER

NAME: **Ammonium Sulfide Solution**

SYNONYMS: Ammonium Bisulfide, Ammonium Hydrogen Sulfide, Ammonium Hydrosulfide, Ammonium Sulfhydrate Solution.

MANUFACTURER: Chemical Products Corporation (CPC)
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24-hour Emergency Phone Number: CHEMTREC 800-424-9300

2. INFORMATION ON INGREDIENTS

<u>COMPONENT</u>	<u>CAS #</u>	<u>EXPOSURE LIMITS</u>	<u>% BY WT</u>
Ammonium Sulfide	12135-76-1	No ACGIH TLV or OSHA PEL established for Ammonium Sulfide. For Hydrogen Sulfide gas: OSHA PEL - 20 ppm. ACGIH TLV-TWA - 10 ppm For Ammonia: OSHA PEL - 50 ppm. ACGIH TLV-TWA - 25 ppm	40 - 44 %
Water	7732-18-5		56 - 60 %

3. HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW: WARNING! CAUSES SEVERE BURNS [R35]
 TOXIC IF SWALLOWED. [R 25]
 HARMFUL BY INHALATION. [R 20]**

When using do not eat or drink. [S 20]

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). [S 45]

Harmful or fatal if vapors are inhaled. Use only with adequate ventilation.

Corrosive liquid may be absorbed through the skin. Wash thoroughly after handling.

POTENTIAL HEALTH EFFECTS: Vapors are extremely irritating to skin, eyes, and respiratory passages. This product is a powerful systemic poison, causing headache, dizziness, and unconsciousness.

Routes of Entry: Inhalation, skin absorption, and possibly ingestion.

Human Effects: Vapors cause superficial irritation to the conjunctiva and cornea of the eye and are extremely irritating to the respiratory passages. More intensive exposure causes coughing, headache, dizziness, unconsciousness, and pulmonary edema. Rapid and spontaneous revival may result from decreasing the exposure intensity. Recovery is eventually complete in most non-fatal cases.

Acute Inhalation: Severe respiratory distress, confusion, weakness of the extremities, unconsciousness, pulmonary edema, asphyxiation and possible central respiratory paralysis leading to death.

Chronic Inhalation: Extreme irritation to respiratory passages.

Acute Skin Contact: Corrosive alkalinity causes burns; in case of absorption, poisoning by sulfide causes headache, nausea, dizziness, confusion, weakness of the extremities, and possible unconsciousness.

Chronic Skin Contact: Extreme irritation to skin.

Acute Eye Contact: Alkali burns to conjunctiva and cornea.

Chronic Eye Contact: Extreme irritation to the eyes caused by vapor or mist; corneal opacity.

Acute Ingestion: Rapid breathing, confusion, unconsciousness, paralysis of respiratory muscles leading to death.

Chronic Ingestion: Headache, nausea, dizziness, confusion, and possibly alkali burns to the esophagus.

Carcinogenicity: NTP.....: Not listed.
IARC.....: Not listed.
OSHA.....: Not regulated.

Medical Conditions Aggravated by Exposure: None are known.

4. FIRST AID MEASURES

Ingestion: Have victim drink as much milk, diluted vinegar, lemon juice, orange juice, or water as possible. Do not induce vomiting. If vomiting occurs, give more liquids. Never give anything by mouth to an unconscious person.

Inhalation: Remove from contaminated atmosphere. Begin artificial respiration immediately if necessary. Begin CPR immediately if necessary. Administer oxygen if it is available.

Eye Contact: Flush with large quantities of water for at least 15 minutes. Always seek medical attention.

Skin Contact: Flush with large quantities of water. Wash with soap and water if available.

5. FIRE FIGHTING MEASURES

Flashpoint: 29° C (84° F) by Cleveland Open Cup Test, ASTM D93. 7° C (45° F) by TAG Closed Cup Test (the vapors above the liquid burn without the characteristic "flash").

Flammability: The vapors above the liquid form flammable mixtures with air from about 4% vapor up to about 69 % vapor.

Autoignition: About 260° C (500° F).

General Hazard: Poison, flammable hydrogen sulfide gas and/or poison, flammable ammonia will be evolved from this product on exposure to heat, acid, or strong alkali.

Fire Fighting Instructions: Firefighters should wear self-contained breathing apparatus. Do not use carbon dioxide because it will cause poisonous hydrogen sulfide gas to be liberated from this product.

Fire Fighting Equipment: Use water in flooding quantities. A heavy fog of water may be effective in knocking down vapors.

Hazardous Combustion Products: Poisonous sulfur dioxide gas will be generated if the vapors from this product burn.

6. ACCIDENTAL RELEASE MEASURES

Small Spill: Absorb in dirt, sawdust, fly ash, or other inert absorbant. Scoop up and store in sealed containers. Dispose of in accordance with local, state, or federal regulations.

Large Spill: Dike to prevent entry into sewers or drains. Recover as much of the solution as possible. Mix spilled solution with dilute excess hydrogen peroxide to oxidize sulfide and eliminate danger of hydrogen sulfide evolution.

7. HANDLING AND STORAGE

Storage Temperature: Product should be kept as cool as possible to minimize its vapor pressure which is about 4 psi at 20° C (68° F). This material boils at 46° C (115° F).

Storage Pressure: Atmospheric or above.

General: Put a vapor trap or scrubber on tank vent.

--Poisonous hydrogen sulfide, ammonia, and ammonium hydrosulfide will be present in the vapor space above ammonium sulfide solution. Do not enter tanks or other vessels that have contained ammonium sulfide solution unless fresh air breathing apparatus is used. --
Do not store in contact with copper, zinc, or aluminum.

--Preferred material of construction for storage tanks is stainless steel; however, carbon steel is acceptable.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Adequate ventilation is required to remove the toxic and flammable vapors or mist which will probably be present above ammonium sulfide solution. Safety shower and eyewash fountain should be available in the work area.

Respiratory Protection: Use self-contained breathing apparatus or supplied-air respirator if the PEL for hydrogen sulfide or ammonia might be exceeded.

Skin Protection: Rubber suits and boots as needed for protection from splashing.

Eye Protection: Chemical safety goggles and safety shield for protection from splashing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid.

Vapor Pressure: About 4 psi at 20° C (68° F), consisting of ammonia, hydrogen sulfide, and ammonium hydrosulfide.

Specific Gravity: About 0.98

Solubility in Water: Complete.

pH: 9.5

Boiling Point: 46° C (115° F).

Melting Point: About -40° C (-40° F).

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Odor: Ammonia odor mixed with "rotten egg" odor.

Appearance: Yellow, transparent liquid.

10. STABILITY AND REACTIVITY

Chemical Stability: Mixing with acids liberates poisonous hydrogen sulfide. Mixing with strong alkalis liberates poisonous ammonia gas. Mixing with strong oxidizers causes a rapid reaction which liberates heat.

Incompatibility: Acids, strong alkalies, and strong oxidizers.

Hazardous Decomposition Products: High temperatures will decompose this product to poisonous hydrogen sulfide gas and poisonous ammonia gas.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Eye: Corrosive due to product's alkalinity.

Skin: Corrosive to skin due to product's alkalinity. Toxic when absorbed through intact skin. LD₅₀ is 2457 mg/kg for mouse, 692 mg/kg for adult guinea pig, and 119 mg/kg for adult rabbit.

Ingestion: TOXIC - Human Oral LD₅₀ reported to be 50 mg/kg for Na₂S. Equivalent to 94 mg/kg for this product (based on sulfur content).

Inhalation: TOXIC - Hydrogen sulfide inhalation is assumed. Human LC₅₀ is 600 ppm for 30 minutes for hydrogen sulfide; equivalent to 2700 ppm for respirable mist from this product.

Sub-chronic: Irritation to the conjunctiva and cornea of the eye from vapors.

Chronic/Carcinogenic: Not a known carcinogen. Chronic acute exposures to vapors may cause neurologic deficits like those in survivors of other severe asphyxiant poisonings.

Teratogenic: Not known.

Reproductive: Not known.

Mutagenic: Not known.

12. ECOLOGICAL INFORMATION

TOXICITY: Only the strength of this product contributes to its environmental toxicity. Dilution yields only naturally-occurring chemical species. For mosquito fish (*Gambusia Affinis*), the 96 hour TLM in turbid water at 21° C is 248 mg/l.

DISTRIBUTION: All components of this product are found naturally in all ecosystems.

CHEMICAL FATE: With dilution, both the ammonia and the sulfide will be readily incorporated into the preexisting natural nitrogen cycle and sulfur cycle, respectively.

13. WASTE MANAGEMENT INFORMATION

Waste containing sulfide is hazardous and must be disposed of in an approved hazardous waste landfill. Sulfide can be oxidized with dilute hydrogen peroxide to non-hazardous sulfate; care should be taken as the reaction may be violent.

14. TRANSPORT INFORMATION

U.S. D.O.T. and International Shipping Name..... : Ammonium sulfide solution.

Technical Shipping Name..... : Ammonium sulfide solution.

D.O.T. Hazard Class..... : 8 – Corrosive.

Subsidiary Hazards.....: 6.1 – Poison; 3 - Flammable Liquid

U.N./N.A. Number..... : UN 2683.

Product R.Q. (lbs)..... : 100 lbs. of Ammonium sulfide.
240 lbs. of this product.

D.O.T. Label..... : CORROSIVE, POISON,
FLAMMABLE LIQUID.

D.O.T. Placard..... : CORROSIVE.

Freight Class Bulk..... : Inorganic chemical.

Freight Class Package..... : Inorganic Chemical.

Product Label..... : Ammonium Sulfide, Solution.

15. REGULATORY INFORMATION

OSHA Status..... : This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200. It is classified as toxic based on inhalation, skin absorption, and ingestion information.

TSCA Status..... : Listed on TSCA Inventory.

CERCLA Reportable Quantity..... : 100 lbs. of Ammonium sulfide.
240 lbs. of this product.

SARA Title III:

Section 302, Extremely Hazardous Substances.... : None.

Section 311/312, Hazard Categories..... : Category 1 (Acute Hazard).

Section 313, Toxics Release Inventory..... : Releases of ammonia and ammonium ion from all ammonium compounds must be reported.

RCRA Status.....: If discarded in its purchased form, this product would be a hazardous waste because of its sulfide content. Under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing or derived from this product would be classified as a hazardous waste under 40 CFR 261.20-24.

16. OTHER INFORMATION

NFPA Rating (National Fire Protection Association):

Health - 3 (Materials which on short exposure could cause serious temporary or residual injury).

Fire - 2 (Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur).

Reactivity - 1 (Materials which are normally stable but which can become unstable at elevated temperature and pressure).

Special - NA

Reason for Issue.....: Minor format changes.

Prepared by..... : Jerry A. Cook.

Title..... : Technical Director.

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