AMMONIUM THIOSULFATE SOLUTION (ATS) 60%
(12-0-0-26s)
MATERIAL SAFETY DATA SHEET

SECTION I:  CHEMICAL PRODUCT – COMPANY IDENTIFICATION

MANUFACTURER:  KUGLER COMPANY
ADDRESS:  209 West 3rd Street; PO Box 1748
           McCook, NE 69001
TELEPHONE NO:  308-345-2280
DATE PREPARED:  August 9, 2006
CHEMICAL NAME:  AMMONIUM THIOSULFATE
TRADE NAME (COMMON NAME OR SYNONYM):  Ammonium Thiosulfate Solution 60% (12-0-0-26s)
CHEMICAL TYPE:  Ammoniated Sulphur Compound

SECTION II  HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>FORMULA</th>
<th>WT%</th>
<th>TLV</th>
<th>LD*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur</td>
<td>S</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrogen</td>
<td>N</td>
<td>12</td>
<td></td>
<td></td>
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<tr>
<td>Ammonium Thiosulfate</td>
<td>(NH₄)₂S₂O₃</td>
<td>60</td>
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Ammonium thiosulfate is produced by reacting sulfur dioxide (SO₂) and ammonia (NH₃) to yield a 60% solution containing 26% sulfur and 12% nitrogen.

*ORAL LD-50, mg/kg, male rat

SECTION III  PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT:  N/A
SOLUBILITY IN WATER:  Complete
DENSITY:
% VOLATILE (BY VOLUME):  1%
pH:  7.5-8.5
VAPOR PRESSURE, mmHg:  N/A
SPECIFIC GRAVITY:  1.325 @ 70 degrees F
FREEZING POINT:  23 degrees F
CRYSTALLIZATION TEMPERATURE:  10 degrees F
APPEARANCE:  Clear, white solution with slight ammonia odor
HAZARD RATING (NFPA):  FIRE:  HEALTH:  REACTIVITY:  SPECIAL:
EVAPORATION RATE:
FREEZING POINT:  23 degrees F
CRYSTALLIZATION TEMPERATURE:  10 degrees F
APPEARANCE:  Clear, white solution with slight ammonia odor
HAZARD RATING (NFPA):  FIRE:  HEALTH:  REACTIVITY:  SPECIAL:

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:  Non-flammable
REACTION WITH WATER:  None
### Section I: Physical and Chemical Properties
- **Flammable Limits (% by Volume):** Lower: N/A, Upper: N/A
- **Autoignition Temperature:** None
- **Extinguishing Media:** Non-Flammable. Use media suitable to extinguish source of fire.
- **Special Fire Fighting Procedures:** Wear self-contained breathing apparatus and full protective clothing.

### Section V: Reactivity Data
- **Stability:** Stable
- **Conditions to Avoid:** Avoid fire conditions.
- **Hazardous Decomposition Products:** In combination with ammonia, it will precipitate and release heat. In combination with acids, it precipitates sulfur and liberates \( \text{SO}_2 \) gas. Begins to decompose over 190 degrees F.
- **Hazardous Polymerization:** Will not occur
- **Conditions to Avoid:** Do not mix with Anhydrous Ammonia, Phosphoric Acid or other strong acids or Zinc Sulfate.
- **Incompatibility (Materials to Avoid):** Dry ammonium Nitrate or oxidizers. Anhydrous Ammonia, strong acids or acid solutions above pH 5.8, Zinc Sulfate, and ammonium polysulfide solution.

### Section VI: Health Hazard Data
- **Ingestion:** Oral Toxicity: Ingestion of large amount may cause systemic ammonia poisoning and nitrate poisoning.
- **Inhalation:** No hazard under normal conditions.
- **Skin Absorption:** Not absorbed through skin.
- **Skin Contact:** May be irritating to skin.
- **Eye Contact:** May be irritating to eyes.
- **Effects of Overdose:** Ingestion of a large amount may cause dizziness, abdominal cramps, vomiting and diarrhea. Irritating to skin and eyes.
- **Skin Absorption:** Not absorbed through skin.
- **Skin Contact:** May be irritating to skin.
- **Eye Contact:** May be irritating to eyes.
- **Effects of Overdose:** Ingestion of a large amount may cause dizziness, abdominal cramps, vomiting and diarrhea. Irritating to skin and eyes.

### Section VII: Precautions for Safe Handling & Use
- **Ventilation:** Natural ventilation.
- **Normal Handling:** Temperatures should be kept above 32 degrees F to keep solution liquid and pumpable. Store separate from flammable liquids, acids, oils and other organic reducing agents. Do not expose to fire. Store in a well-ventilated area. DO NOT ALLOW TO DRY.
- **Precautionary Label:** None

### Section VIII: Control Measures
- **Respiratory Protection:** None required under normal conditions.
- **Eyes and Face:** Safety glasses with side shield and/or chemical splash-proof goggles.
- **Hands, Arms and Body:** Normal work clothing and impervious gloves.
- **Other Clothing & Equipment:** Normal work clothing and impervious gloves.

### Section IX: Environmental
- **Aquatic Toxicity Rating:**
TLm 96: 1000-100 ppm. Urea: TLm 96: over 1000 ppm. Low toxicity to fish. Do not contaminate any watercourse or any body of water by direct application, cleaning of equipment or disposal.

WASTE DISPOSAL METHODS:
Absorb in diatomaceous earth product, sweep up and place into containers for use, return to manufacturer, or disposal. Follow local, state and federal regulations for disposal.

STEPS TO BE TAKEN IN CASE OF MATERIAL RELEASE/SPILL:
Dike area and maximize recovery. Absorb in diatomaceous earth. Sweep up and place into containers for recycle or disposal. Wash area with water. Prevent entry into sewer or watercourses.

SECTION X REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES: N/A
REGULATORY STANDARDS:
GENERAL:

WASTE DISPOSAL METHODS:
Absorb in diatomaceous earth product, sweep up and place into containers for use, return to manufacturer, or disposal. Follow local, state and federal regulations for disposal.

STEPS TO BE TAKEN IN CASE OF MATERIAL RELEASE/SPILL:
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SECTION XI SHIPPING DATA

SHIPPING NAME: Ammonium Thiosulfate
C.A.S. NUMBER: 7783-18-8
HAZARD CLASS:
D.O.T. NUMBER:
REPORTABLE QUANTITY:
HAZARDOUS WASTE #:
LABELS REQUIRED: None
E.P.A. REGISTRATION: None
PLACARDS: None

SECTION XII ADDITIONAL INFORMATION

The information and recommendations contained herein are offered as a service to our customers, but are not intended to relieve the user from its responsibility to investigate and understand other pertinent sources of information and to comply with all laws and procedures applicable to the safe handling of these materials. The information and recommendations provided herein were believed by KUGLER to be accurate at the time of preparation or obtained from sources believed to be generally reliable. However, KUGLER makes no warranty concerning their accuracy and KUGLER will not be liable for any claims relating to any party's use or reliance on information or recommendations contained herein regardless of whether it is claimed that the information or recommendations are inaccurate, incomplete or otherwise misleading.