



# Safety Data Sheet

## THIO-SUL®

MSDS Number: 5500

Revision: 7/20/09

<b>Section</b>	<b>1:</b>	<b>Identification</b>
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- 1a. Product Name** ..... THIO-SUL®
- 1b. Other Identification:**
- |                         |  |
|-------------------------|--|
| Chemical Family         | Inorganic salt solution  |
| Synonyms                | Ammonium thiosulphate; ATS; Thiosulfuric acid, (H <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ), diammonium salt; Ammonium hyposulfite; Ammonium hypo solution, Ammonium hiposulphite |
| Formula                 | (NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>3</sub>  |
| EC Pre-Registration No. | 05-2118047540-50-0000  |
- 1c. Recommended Use of Chemical:** Agricultural Industry – Fertilizer use  
Photographic – photochemical use
- 1d. Manufacturer**
- |             |  |
|-------------|--|
|             | Tessenderlo Kerley Inc.<br>2255 N. 44 <sup>th</sup> Street, Suite 300<br>Phoenix, Arizona 85008-3279 |
| Information | (602) 889-8300   |
- 1e. Emergency Contact** (800) 877-1737 (Tessenderlo Kerley, Inc.)  
**(800) 424-9300 (CHEMTREC)**

<b>Section</b>	<b>2:</b>	<b>Hazard(s) Identification</b>
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- 2a. Hazard Classification:**
- |          |      |
|----------|------|
| Health   | None |
| Physical | None |
- 2b. Signal Word** Not Applicable
- Hazard Statement(s):** Not Applicable
- Symbol(s):** Not Applicable
- Precautionary Statement(s):** Avoid contact with eyes.  
Use/store in cool, well ventilated areas.  
Avoid prolonged /repeated breathing of vapors.  
Avoid prolonged/repeated contact with the skin.  
Keep away from any sources of heat or flames.  
Store totes or small containers out of direct sunlight.  
Wear protective apron, gloves and eye and face protection.  
Do not allow release to aquatic waterways.
- 2c. Unclassified Hazard(S):** None
- 2d. Unknown Toxicity Ingredient:** None

<b>Section</b>	<b>3:</b>	<b>COMPOSITION/ INFORMATION ON INGREDIENTS</b>
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### 3.1 Chemical Ingredients (See Section 8 for exposure guidelines)

<b>Component</b>	<b>CAS #</b>	<b>EINECS #</b>	<b>% by Wt.</b>
Ammonium thiosulfate	7783-18-8	231-9820	50 - 60%
Ammonium sulfate	7783-20-2	231-984-1	0 - 6%
Ammonium sulfite (s)	10196-04-0	233-484-9	0.5 - 5%
Water	7732-18-5	231-791-2	29 - 49.5%

<b>Section</b>	<b>4:</b>	<b>FIRST AID MEASURES</b>
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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 medical attention if irritation occurs.

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

**4.3 INGESTION:** If victim is conscious, give 2 to 4 glasses of water and induce vomiting by touching finger to back of throat. Obtain 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 medical attention.

<b>Section</b>	<b>5:</b>	<b>FIRE FIGHTING MEASURES</b>
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### 5.1 FLAMMABLE PROPERTIES: (See Section 9, for additional flammable properties)

Heating this product will evolve ammonia.

Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness.

**NFPA:**                **Health - 1**        **Flammability - 0**        **Reactivity - 0**

### 5.2 EXTINGUISHING MEDIA:

**5.2.1 Suitable Extinguishing Media:** Not flammable, use media suitable for combustibles involved in fire.

**5.2.2 Unsuitable Extinguishing Media:** None known

### 5.3 PROTECTION OF FIREFIGHTERS:

#### 5.3.1: Specific hazards arising from the chemical:

**Physical hazards** Heating (flames) of closed or sealed containers may cause violent rupture of container due to thermal expansion of compressed gases.

**Chemical hazards** Heating causes release of ammonia vapors. Vapors are irritating to eyes,

skin and respiratory tract. Heating to dryness may cause the release of ammonia, ammonium sulfate, sulfur and oxides of sulfur.

**5.3.2: Protective equipment and precautions for firefighters:** Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear. Keep containers/storage vessels in fire area cooled with water spray.

<b>Section</b>	<b>6:</b>	<b>ACCIDENTAL RELEASE MEASURES</b>
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### 6.1 PERSONAL PRECAUTIONS

Use personal protective equipment specified in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

### 6.2 ENVIRONMENTAL PRECAUTIONS

This product is not a water pollutant, but should be kept out of "waters of the US" because of potential aquatic toxicity (See Section 12). This product is a non-hazardous liquid fertilizer solution designed to supply nitrogen and sulfur to various crops.

### 6.3 METHODS OF CONTAINMENT

**Small releases:** Confine and absorb small releases on sand, earth or other inert absorbent.

**Large releases:** Shut off release if safe to do so. Dike spill area with earth, sand or other inert absorbent to prevent runoff into surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (above)

### 6.4 METHODS FOR CLEANUP

**Small release:** For small areas use water spray to dilute to a weak fertilizer solution, taking care not to let water runoff out of containment area.

**Large release:** Recover as much of the spilled product using portable pump and hoses. Treat remaining material as a small release (above). Spread fertilizer material over a wide area to avoid over fertilizing effects.

### 6.5 OTHER INFORMATION NA

<b>Section</b>	<b>7:</b>	<b>HANDLING and STORAGE</b>
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**7.1 Handling:** Avoid contact with eyes. Use only in a well ventilated area. Wash thoroughly after handling. Avoid prolonged or repeated breathing of vapors. Avoid prolonged or repeated contact with the skin.

**7.2 Storage:** Store in well ventilated areas. 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. (See Section 10.4 for materials of construction)

<b>Section</b>	<b>8:</b>	<b>EXPOSURE CONTROLS/ PERSONAL PROTECTION</b>
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<b>8.1 EXPOSURE GUIDELINES:</b>	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
	NA	NA	NA	NA

**8.2 ENGINEERING CONTROLS:** Use adequate exhaust ventilation to prevent inhalation of product vapors.

### 8.3 PERSONAL PROTECTIVE EQUIPMENT (PPE)

**8.3.1 Eye/Face Protection:** Chemical goggles and a full face shield.

**8.3.2 Skin Protection:** Neoprene rubber gloves and apron should be worn to prevent repeated or prolonged contact with the liquid. Wash contaminated clothing prior to reuse.

**8.3.3 Respiratory Protection:** None generally required. If conditions exist where mist may be generated, a NIOSH/MSHA approved mist respirator should be worn.

**8.3.4 General Hygiene Considerations:** There are no known hazards associated with this product. When used as recommended, however, common good industrial hygiene practices should be followed, such as, washing thoroughly after handling and before eating or drinking.

<b>Section</b>	<b>9:</b>	<b>PHYSICAL and CHEMICAL PROPERTIES</b>
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<b>9.1 APPEARANCE/STATE/ODOR:</b>	Colorless to yellow to tan liquid which may have a slight ammonia and/or organic odor
<b>9.2 pH :</b>	6.5 to 8.5
<b>9.3 FREEZING POINT:</b>	30 °F – 60 °F (-1.1 °C – 15.6 °C) typical
<b>9.4 BOILING POINT:</b>	210 °F (98.9 °C) - 220 °F (104.4 °C)
<b>9.5 FLASH POINT :</b>	Not applicable
<b>9.6 EVAPORATION RATE:</b>	Not applicable
<b>9.7 FLAMMABILITY :</b>	Not applicable
<b>9.8 FLAMMABILITY LIMITS:</b>	Not applicable
<b>9.9 VAPOR PRESSURE:</b>	18 mm @ 70 °F (21.1 °C)
<b>9.10 VAPOR DENSITY:</b>	Not applicable
<b>9.11 SPECIFIC GRAVITY:</b>	1.32 - 1.35 (11.0 - 11.2 lbs/gal)
<b>9.12 SOLUBILITY:</b>	Complete

<b>Section</b>	<b>10:</b>	<b>STABILITY and REACTIVITY</b>
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**10.1 CHEMICAL STABILITY:** This is a stable material under normal [60-120 °F (15-49 °C)] temperatures and pressure [14.7 psig (760 mm Hg)]

**10.2 CONDITIONS TO AVOID:** Temperatures above 120 °F (49 °C) and below 60 °F (15 °C).

**10.3 INCOMPATIBLE MATERIALS:** Acids will cause the release of sulfur dioxide, a severe respiratory hazard. Alkalies will accelerate the evolution of ammonia. Ammonium thiosulfate solution 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)

**10.4 HAZARDOUS DECOMPOSITION PRODUCTS:** Heating this product will evolve ammonia. Heating to dryness will cause the production of ammonia, ammonium sulfate, sulfur and oxides of sulfur. Ammonia (16-25%) may form flammable mixtures with air.

**10.5 POSSIBILITY OF HAZARDOUS REACTIONS:** Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness.

<b>Section</b>	<b>11: TOXICOLOGICAL INFORMATION</b>
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**11.1 ORAL:** Oral-Rat LD<sub>50</sub>: 1,950 - 2,890 mg/kg (ammonium thiosulfate)  
 Oral-Mouse LD<sub>50</sub>: 2,100 - >3,000 mg/kg (ammonium thiosulfate)  
 Oral-Rat LD<sub>50</sub>: 2,000 – 4,250 mg/kg (ammonium sulfate)

**11.2 DERMAL:** Data not available. Skin Irritation/corrosion test on Rabbit & Rat: Non-Irritating  
 Rat > 2,000 mg/kg (ammonium sulfate)

**11.3 INHALATION:** Inhalation-Rat LC<sub>50</sub>: > 2,260 mg/m<sup>3</sup> (4 hrs - ammonium thiosulfate)  
 Inhalation-Mouse LC<sub>50</sub>: > 1,800 mg/m<sup>3</sup> (4 hrs - ammonium thiosulfate)  
 Inhalation-Rabbit LD<sub>50</sub>: > 2,200 ug/m<sup>3</sup> (1 Hr - ammonium sulfate)

**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

Additional product testing data is available from "TFI Product testing Program", The Fertilizer Institute, April 2003 .

<b>Section</b>	<b>12: ECOLOGICAL INFORMATION</b>
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Static acute 96 hour-LC<sub>50</sub> for bluegills is 1,000 mg/L.  
 Static acute 96 hour-LC<sub>50</sub> for rainbow trout is 770 mg/L.  
 Static acute 96 hour-LC<sub>50</sub> for sheepshead minnow is > 1,000 mg/L.  
 Static acute 96 hour-LC<sub>50</sub> for mysid shrimp is 77 mg/L.

<b>Section</b>	<b>13: DISPOSAL CONSIDERATIONS</b>
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If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Consult state and local regulations for different or more restrictive disposal regulations.

<b>Section</b>	<b>14: TRANSPORT INFORMATION</b>
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**14.1 BASIC SHIPPING DESCRIPTION**

<b>14.1.1 Proper Shipping Name:</b>	Ammonium thiosulfate solution ( <i>Non-hazardous</i> )
<b>14.1.2 Hazard Class(s):</b>	NA
<b>14.1.3 Identification Number:</b>	NA
<b>14.1.4 Packing Group:</b>	NA

- 14.1.5 **Hazardous Substance:** No  
 14.1.6 **Marine Pollutant:** No

## 14.2 ADDITIONAL INFORMATION

### 14.2.1 Other DOT Requirements

- 14.2.1.1 **Reportable Quantity:** No  
 14.2.1.2 **Placard(s):** NA  
 14.2.1.3 **Label(s)** NA

14.2.2 **USCG Classification:** Class 43, Misc. water solutions Chris Code – ATV

### 14.2.3 International Transportation

- 14.2.3.1 **IMO:** Pollution Category (C) See USCG, Section 14.2.2  
 14.2.3.2 **IATA:** Proper Shipping Description – See US DOT Section 14.1.1.  
 14.2.3.3 **TDG (Canada):** Proper Shipping Description – See US DOT Section 14.1.1.

- 14.2.3.4 **ADR (Europe):** Unk  
 14.2.3.5 **ADG (Australia):** Unk

14.2.4 **Emergency Response Guide:** Not applicable

14.2.5 **Emergency Response Assistance Plan:** Not applicable

14.2.6 **Special Precautions:** Not applicable

Section	15: REGULATORY INFORMATION
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## 15.1 US FEDERAL REGULATIONS

15.1.1 **OSHA:** This product meets the definition of a hazardous material under criteria of the Federal OSHA Hazard Communication Standard (29 CFR 1910.1200).

15.1.2 **TSCA:** Product is contained in USEPA Toxic Substance Control Act Inventory

15.1.3 **CERLA:** Reportable Quantity – Not applicable

15.1.4 **SARA Title III:**

- |  |            |
|--|------------|
| 15.1.4.1 <b>Extremely Hazardous Substance (EHS):</b> | Not Listed |
| 15.1.4.2 <b>Section 312 (Tier II) ratings:</b>       | Yes        |
| Immediate (acute)                                    | Yes        |
| Fire   | No         |
| Sudden release                                       | No         |
| Reactivity   | No         |
| Delayed (chronic)                                    | No         |

15.1.4.3 **Section 313 (FORM R):** Ammonia (CAS # 7664-41-7) – 14.6%

15.1.5 **RCRA** (Resource Conservation and Recovery Act) Status: Not Applicable

15.1.6 **CAA** Hazardous Air Pollutant (HAP): Not Applicable

## 15.2 INTERNATIONAL REGULATIONS

### 15.2.1 Canada

- 15.2.1.1 **WHIMIS:** Not Applicable  
 15.2.1.2 **DSL/NDL:** Listed in DSL, Record # 8479

<b>Section</b>	<b>16: OTHER INFORMATION</b>
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**REVISIONS:** The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993, by Technical Services-Tessenderlo Kerley, Inc.

Address updated, 4/30/99

Section 8.3, Eye Protection revised and logo revised, 4/29/02

Section 2.1, ingredient adjusted, Section 11 toxicity data added, Section 14.1 clarified, and

Section 9 adjusted 6/15/04

Entire MSDS revised to conform to ANSI Z400.1-2004, and GHS. 7/20/2009

THE INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPILED FROM OUR EXPERIENCE AND OSHA, ANSI, NFPA, DOT, ERG, AND CHRIS. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION FOR THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVISE MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILABLE.
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