Safety Data Sheet
Thio-Sul®

SDS Number: 55 **Revision:** March 11, 2015

Section 1: IDENTIFICATION

1.1 Product Name: **Thio-Sul®**

1.2 Other Identification:

Chemical Family: Inorganic salt solution
Formula: $(NH_4)_2S_2O_3$

1.3 Recommended Use of Chemical: Agricultural Industry – Liquid fertilizer use.

1.4 Manufacturer: Tessenderlo Kerley, Inc.
2255 N. 44th Street, Suite 300
Phoenix, Arizona 85008-3279
Information: (602) 889-8300

1.5 Emergency Contact: Tessenderlo Kerley, Inc. (800) 877-1737
CHEMTREC (800) 424-9300 Domestic
(703) 527-3887 International

Section 2: HAZARD(S) IDENTIFICATION

2.1 Hazard Classification: Health None
Physical None

2.2 Signal Word: Not applicable

2.3 Hazard Statement(s): Not applicable

2.4 Symbol(s): Not applicable

2.5 Precautionary Statement(s): Not applicable

2.6 Unclassified Hazard(s): None

2.7 Unknown Toxicity Ingredient: None

Section 3: COMPOSITION/INFORMATION on INGREDIENTS

3.1 Chemical Ingredients: (See Section 8 for exposure guidelines)

Chemical	Synonym Common Name	CAS No.	EINECS No.	% by Wt.
Thiosulfuric acid ($H_2S_2O_3$), diammonium salt	Ammonium thiosulfate	7783-18-8	231-982-0	50 - 60
Diazanium sulfate	Ammonium sulfate	7783-20-2	231-984-1	0 - 9
Ammonium sulfite	Ammonium sulfite	10196-04-0	233-484-9	0.1 - 5
Water	Water	7732-18-5	231-791-2	Remaining %

Section 4: FIRST AID MEASURES

4.1 Symptoms/Effects:

Acute: Eye contact may cause eye irritation. Repeated or prolonged skin contact may cause skin irritation. Ingestion may irritate the gastrointestinal tract.

Chronic: No known chronic effects.

4.2 Eyes: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to ensure thorough flushing of the entire area of the eye and lids. Obtain medical attention if irritation occurs.

4.3 Skin: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Continue rinsing. Obtain medical attention if irritation occurs.

4.4 Ingestion: If victim is conscious, give two to four glasses of water and induce vomiting by touching finger to back of throat. Obtain medical attention.

4.5 Inhalation: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start CPR. Obtain medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 Flammable Properties: (See Section 9 for additional flammable properties)

Heating this product will evolve ammonia.

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: Not applicable.

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 (respiratory hazard).

5.3.2 Protective Equipment and Precautions for Firefighters:

Firefighters should wear self-contained breathing apparatus (SCBA) and full fire-fighting turnout gear. Keep containers/storage vessels in fire area cooled with water spray.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions: Use personal protective equipment specified in Section 8. Isolate the release area and deny entry to unnecessary, unprotected and untrained personnel.

6.2 Environmental Precautions: Keep out of "waters of the United States" because of potential aquatic toxicity (See Section 12). This product is a non-hazardous liquid fertilizer solution designed to supply nitrogen and sulfur to agricultural crops.

6.3 Methods of Containment:

Small Release: Confine and absorb small releases with sand, earth or other inert absorbents.

Large Release: Shut off release if safe to do so. Dike spill area with earth, sand or other inert absorbents to prevent runoff into surface waterways (potential aquatic toxicity), storm drains or sewers.

6.4 Method for Cleanup:

Small Release: Shovel up absorbed material and place in drums for disposal as a chemical waste or recycle as a fertilizer as the original product was intended.

Large Release: Recover as much of the spilled product as possible using portable pump and hoses. Use as originally intended or dispose of as a chemical waste. Treat remaining material as a small release (above).

Section 7: HANDLING and STORAGE

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 totes and smaller containers out of direct sunlight at moderate temperatures. (See Section 10.5 for materials of construction.)

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Guidelines:

Chemical	OSHA PELs		ACGIH TLVs	
	TWA	STEL/C	TLV	STEL
Not applicable				

8.2 Engineering Controls: Use adequate exhaust ventilation to prevent inhalation of product vapors. Maintain eye wash/safety shower in areas where product is handled

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 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.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

9.1 Appearance:	Colorless to yellow liquid
9.2 Odor:	May have slight ammonia or organic odor
9.3 Odor Threshold:	Ammonia – 0.037 ppm (0.026 mg/m^3)
9.4 pH:	7 - 8 (*Typical)*
9.5 Melting Point/Freezing Point:	30°F – 60°F (-1.1°C – 15.6°C) (*Typical*)
9.6 Boiling Point:	210°F - 220°F (98.9°C - 104.4°C)
9.7 Flash Point:	Not applicable
9.8 Evaporation Rate:	Not determined
9.9 Flammability:	Not applicable
9.10 Upper/Lower Flammability Limits:	Not applicable
9.11 Vapor Pressure:	18 mm Hg (2.4 kPa) @ 70°F (21.1°C)
9.12 Vapor Density:	Not determined
9.13 Relative Density:	1.32 - 1.35 (11.0 - 11.2 lbs/gal)
9.14 Solubility:	800 gm/L @ 20°C (water) *100% ammonium thiosulfate*
9.15 Partition Coefficient:	Not applicable
9.16 Auto-ignition Temperature:	Not applicable
9.17 Decomposition Temperature:	302°F (150°C) *100% ammonium thiosulfate*
9.18 Viscosity:	4.7 Cp (0.0047 Pa s) at 25°C (77°F)

Section 10: STABILITY and REACTIVITY

10.1 Reactivity: Avoid interaction with heat (flames), oxidizers, acids or alkalis (see details below in this section).

10.2 Chemical Stability: Thio-Sul® is a stable material under normal (ambient) temperature and pressure.

10.3 Possibility of Hazardous Reactions: Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness.

10.4 Conditions to Avoid: Temperatures above 120°F (49° C) and below 60°F (15° C).

10.5 Incompatible: Acids will cause a release of sulfur dioxide, a severe respiratory hazard. Alkalis 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.

10.6 Hazardous Decomposition Products: Heating this product will evolve ammonia. Heating to dryness will produce ammonia, ammonium sulfate, sulfur and oxides of sulfur.

Section 11: TOXICOLOGICAL INFORMATION

11.1 Oral: Oral-Rat LD_{50}: 1,950 - 2,890 mg/kg (ammonium thiosulfate).
Oral-Mouse LD_{50}: 2,100 - >3,000 mg/kg (ammonium thiosulfate).
Oral-Rat LD_{50}: 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_{50}: > 2,260 mg/m^3 (4 hrs - ammonium thiosulfate).
Inhalation-Mouse LC_{50}: > 1,800 mg/m^3 (4 hrs - ammonium thiosulfate).
Inhalation-Rabbit LD_{50}: > 2,200 ug/m^3 (1 hr - ammonium sulfate).

11.4 Eyes: Eye irritation/corrosion, Rabbit, OECD 405. Non-irritating (ammonium thiosulfate).

11.5 Chronic/Carcinogenicity: Not listed in NTP, IARC or by OSHA.

11.6 Teratology: Data not available.

11.7 Reproduction: Data not available.

11.8 Mutagenicity: Data not available.

Section 12: ECOLOGICAL INFORMATION

12.1 Ecotoxicity: Static acute 96 hour-LC_{50} for bluegills is 1,000 mg/L.
Static acute 96 hour-LC_{50} for rainbow trout is 770 mg/L.
Static acute 96 hour-LC_{50} for sheepshead minnow is > 1,000 mg/L.
Static acute 96 hour-LC_{50} for mysid shrimp is 77 mg/L.

12.2 Persistence & Degradability: No data available.

12.3 Bioaccumulative Potential: This product is not bioaccumulative.

12.4 Mobility in Soil: No data available.

12.5 Other Adverse Effects: None

Section 13: DISPOSAL CONSIDERATIONS

Consult federal, state and local regulations for disposal requirements.

Section 14: TRANSPORT INFORMATION

14.1 Basic Shipping Description:

14.1.1 Proper Shipping Name: Ammonium thiosulfate solution *(Not regulated by DOT)*
14.1.2 Hazard Classes: Not applicable
14.1.3 Identification Number: Not applicable
14.1.4 Packing Group: Not applicable
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): Not applicable
14.2.1.3 Label(s): Not applicable

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: Non-hazardous under IATA regulations.
14.2.3.3 TDG (Canada): Not regulated – See US DOT Section 14.1.1.
14.2.3.4 ADR (Europe): Not regulated
14.2.3.5 ADG (Australia): Not regulated

14.2.4 Emergency Response Guide: Not applicable

14.2.5 ERAP - Canada: Not applicable

14.2.6 Special Precautions: Not applicable

Section 15: REGULATORY INFORMATION

15.1 U.S. Federal Regulations:

15.1.1 OSHA: This product meets the 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 CERCLA: Reportable Quantity – Not applicable

15.1.4 SARA Title III:

15.1.4.1 Extremely Hazardous Substance (EHS): Not applicable

15.1.4.2 Section 312 (Tier II) Ratings:

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: Not applicable

15.1.6 CAA: (Hazardous Air Pollutant/HAP): Not applicable

15.2 International Regulations:

15.2.1 Canada:

15.2.1.1 WHMIS: Not applicable

15.2.1.2 DSL/NDSL: Listed in DSL, Record # 8479.

15.3 State Regulations:

15.3.1 CA Proposition 65: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Section 16: OTHER INFORMATION

REVISIONS: This SDS was reformatted to comply with the new Hazard Communications Standard dated March 26, 2012, by the Regulatory Department of Tessenderlo Kerley, Inc. 7/15/2013.

Revised multiple sections to correct typos and formatting. 3/11/2015.

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