Material Safety Data Sheet

Section 1 - Product and Company Identification

Product Name: Ammonium Thiosulfate Solution

Chemical Category:	Inorganic salt solution	Product Code:	ATS
Product Use:	Agricultural	Molecular Formula:	$(NH_4)_2S_2O_3$ (aqueous)
Synonyms:	Ammonium hyposulfite solution; Thiosulfuric acid, diammonium salt solution	Molecular Weight:	148.21 (anhydrous)

Company Identification:

Agrifos Fertilizer L.L.C.
2001 Jackson Road
Pasadena, TX 77506
United States
www.agrifos.com

Phone Numbers:
General Information: (01)-713-920-5300
Technical Information: (01)-713-920-5331
Transportation Emergency: CHEMTREC (800) 424-9300 (within U.S.)

Section 2 – Hazards Identification

PHYSICAL FORM: Liquid **COLOR:** Colorless to pale yellow to tan **ODOR:** Slight ammonia and/or organic

Emergency Overview

OSHA / ANSI	GHS
WARNING Avoid contact with skin, eyes, and clothing. Wash thoroughly after handling. ANSI: Toxic (inhalation)	**WARNING** If eye irritation persists after rinsing, obtain medical attention.

Routes of Entry: Inhalation, Skin, Eye, Ingestion/Oral

Potential Health Effects – Acute (Immediate):

Inhalation	Inhalation of product mist may irritate the nose, throat and respiratory tract. Heating of this product will evolve ammonia which is irritating to the respiratory tract.
Skin	May cause irritation from prolonged or repeated contact.
Eye	Contact with eyes by product mist or solution may cause irritation or a burning sensation.
Ingestion	Ingestion of product solution may cause irritation of the gastrointestinal tract to include nausea, vomiting and diarrhea. Considered to have low toxicity to humans.

Medical Conditions Aggravated by Exposure: None expected.

Carcinogenic Effects: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 3 – Composition / Information on Ingredients

Chemical Name	CAS Number	% (weight)	UN;EINECS
Ammonium thiosulfate	7783-18-8	50 - 60	231-982-0
Ammonium sulfate	7783-20-2	0 - 6	231-984-1
Ammonium sulfite(s)	10196-04-0	0.5 - 5	233-484-9
Water	7732-18-5	29 - 49.5	231-791-2

Section 4 – First Aid Measures

Inhalation:
- Remove person to fresh air. If breathing is difficult, administer oxygen if qualified to do so. If symptoms persist, call a medical doctor.

Skin:
- Wash skin with soap and plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. If irritation occurs and persists, get medical attention.

Eye:
- Immediately rinse eyes with plenty of water for 15 minutes. Remove contact lenses if worn. Hold eyelids apart during rinsing. If irritation occurs after rinsing, get medical attention.

Ingestion:
- If victim is conscious, give 2 to 4 glasses of water and induce vomiting by touching a finger to the back of the victim's throat. Never give anything by mouth to an unconscious person. Get medical attention.

Notes to Physician:
- Treat symptomatically.

General Information:
- Have the product container or label with you when calling a medical doctor or going for medical treatment.

Section 5 – Fire Fighting Measures

Extinguishing Media:
- Material is non-combustible. In case of fire, use media as appropriate for the surrounding fire. Water spray may be used to cool containers exposed to fire.

Unsuitable Extinguishing Media:
- None known but see Incompatible Materials, Section 10.

Firefighting Procedures:
- Prevent runoff from entering streams, sewers or drinking water supplies.

Unusual Fire and Explosion Hazards:
- Heating to dryness may cause the release of ammonia, ammonium sulfate, sulfur and oxides of sulfur. Ammonia (16-25%) may form flammable mixtures with air. Keep containers of product in the fire area cooled with water spray. Heating this product will evolve ammonia.

Hazardous Combustion Products:
- See previous section - Unusual Fire and Explosion Hazards.

Protection of Firefighters:
- Use full protective clothing. Due to possible release of toxic vapors, wear self-contained breathing approved by NIOSH, CEN or equivalent approval authority.

Section 6 – Accidental Release Measures

Personal Precautions:
- Spilled material may be irritating to eyes, skin and respiratory tract. Wear appropriate personal protective clothing and equipment.

Emergency Procedures:
- Keep unauthorized personnel away. Ventilate closed spaces before entering.

Environmental Precautions:
- For large releases, dike spill area to prevent runoff into sewers, drains or surface waterways (potential aquatic toxicity).

Containment/Clean-up Measures:
- SMALL RELEASE: Confine and absorb small releases with sand, earth or other inert absorbent. Use water spray to dilute residue to a weak fertilizer solution.
- LARGE RELEASE: Shut off or otherwise stop release if it is safe to do so. Recover as much of the solution as possible. Treat remaining material as a small release.

Prohibited Materials:
- No data available

General Information:
- Comply with applicable national, state and local regulations for the reporting of spills or releases and for the disposal of spilled material.

Section 7 – Handling and Storage

Handling:
- Avoid contact with the eyes. Use in well ventilated areas. Wash thoroughly after handling. Avoid prolonged or repeated breathing of vapors or mist. Avoid prolonged or repeated skin contact.

Storage:
- Store in a cool, dry, well ventilated area. Keep away from heat and incompatible materials. Do not wash out empty container and use it for other purposes. Avoid storage near strong acids, alkalis and oxidizers.

Special Packaging and Incompatible Materials:
- 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 10 for additional information on incompatible materials.

Section 8 – Exposure Controls / Personal Protection

Listed Exposure Limits / Guidelines: No occupational exposure limits have been established for this product. ACGIH limits for ammonia are TWA = 25 ppm / STEL = 35 ppm. The OSHA PEL for ammonia is 50 ppm.

Personal Protective Equipment (PPE):

Respiratory Protection: No respiratory protection is generally required for use in a well ventilated area. If conditions exist where vapors or mist may be generated, the use of an approved respirator is recommended (approved by NIOSH, CEN or equivalent approval authority).

Eye / Face Protection: Wear chemical protective goggles and a full face shield.

Hand Protection: Wear neoprene rubber gloves to prevent repeated or prolonged contact with the liquid. Wash hands after handling or use.

Skin / Body Protection: Wear neoprene rubber apron to prevent repeated or prolonged contact with the liquid. Wash contaminated clothing prior to use.

Engineering Measures / Controls: Good, general ventilation should be provided. Mechanical exhaust ventilation is recommended in areas where prolonged or repeated exposure to vapors or mist is a concern.

Section 9 – Physical and Chemical Properties

Appearance:	Colorless to pale yellow to tan liquid	**Odor**:	Slight ammonia and/or organic odor
Boiling Point:	210 – 220°F (98.89 – 104.44°C)	**Vapor Pressure:**	18 mmHg @ 70.00°F (21.1°C)
Melting Point:	30 – 60°F (-1.11 – 15.56°C)	**pH:**	6.5 – 8.5
Specific Gravity:	1.32 – 1.35	**Water Solubility:**	Complete
Density:	11.02 – 11.27 lb/gal	**Viscosity:**	13.46 – 13.77 cP @ 212°F (100°C)

Section 10 – Stability and Reactivity

Stability: Stable under ambient temperatures.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: Heating this product will evolve ammonia.

Incompatible Materials: Acids will cause the 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. Strong oxidizers such as nitrates, nitrites or chlorates can cause explosive mixtures if heated to dryness.

Hazardous Decomposition Products: 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.

Section 11 – Toxicological Information

Potential Health Effects – Ammonium Thiosulfate – Acute (Immediate):

Oral Toxicity (rat): LD_{50}: 3824 mg/kg – slightly toxic

Dermal Toxicity (rabbit): LD_{50}: >2000 mg/kg – slightly toxic

Inhalation Toxicity (rat): LC50: 1790 mg/m^3 – moderately toxic

Potential Health Effects – Ammonium Thiosulfate – Chronis (Delayed):

Carcinogenicity: Not designated by IARC, NTP, ACGIH or OSHA as a probable or suspected human carcinogen.

Section 12 – Ecological Information

Static acute 96-hour LC50 for bluegills = 1000 mg/L
Static acute 96-hour LC50 for rainbow trout = 770 mg/L
Static acute 96-hour LC50 for sheepshead minnow = 1000 mg/L
Static acute 96-hour LC50 for mysid shrimp = 77 mg/L

Section 13 – Disposal Considerations

Ammonium thiosulfate solution is not a listed or characteristic waste under U.S. Federal Hazardous Waste Regulations (40 CFR Part 261). State and local disposal regulations may differ from national disposal regulations. Consult other national, state and local regulations for different or more restrictive disposal regulations.

Section 14 – Transportation Information

United States Department of Transportation (DOT)

DOT Shipping Name:	Ammonium thiosulfate solution	IMO / IMDG:	Not regulated
DOT Hazard Class:	Not regulated	IATA:	Not regulated
UN Number:	Not applicable	TDG:	Not regulated
Packing Group:	Not applicable	ADN:	Not regulated
DOT Placard / Label(s):	Not applicable	ADR:	Not regulated
RQ (Reportable Quantity):	Not applicable		
RR STCC Number:	28-191-73		

Section 15 – Regulatory Information

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:

- **SARA §302:** This product contains no "Extremely Hazardous Substances."
- **SARA §311/312 Hazard Categories:**

Acute Health Hazard:	Yes
Chronic Health Hazard:	No
Fire Hazard:	No
Reactive Hazard:	No
Release of Pressure:	No

- **SARA §313:** This product contains 4.88% of reportable ammonia (based on 10% of aqueous ammonia from water dissociable ammonium salts).

United States		State Right To Know			Inventory
Component	**CAS**	**MA**	**NJ**	**PA**	**U.S. TSCA**
Ammonium thiosulfate	7783-18-8	Yes	No	Yes	Yes
Ammonium sulfate	7783-20-2	Yes	No	Yes	Yes
Ammonium sulfite(s)	10196-04-0	Yes	Yes	Yes	Yes

Inventory (Continued)						
Component	**CAS**	**Canada DSL**	**China IECS**	**EU EINECS**	**Japan ENCS**	**Korea KECL**
Ammonium thiosulfate	7783-18-8	Yes	Yes	Yes	Yes	Yes
Ammonium sulfate	7783-20-2	Yes	Yes	Yes	Yes	Yes
Ammonium sulfite(s)	10196-04-0	Yes	Yes	Yes	Yes	Yes

United States – Environment

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 5000 lb final RQ; 2270 kg final RQ

U.S. - CWA (Clean Water Act) - Hazardous Substances

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5%

U.S. - CWA (Clean Water Act) - Reportable Quantities of Designated Hazardous Substances

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 5000 lb RQ

U.S. - EPA - Designated Generic Categories - Aqueous Ammonia

- Ammonium thiosulfate 7783-18-8 50% TO 60% NH3 Equiv. Wt. % = 22.98
- Ammonium sulfate 7783-20-2 0% TO 6% NH3 Equiv. Wt. % = 25.78

U.S. - EPA - HPV (High Production Volume) Challenge Program Chemical List

- Ammonium thiosulfate 7783-18-8 50% TO 60% Indicators 2,4; ICCA Confirmed Commitment
- Ammonium sulfate 7783-20-2 0% TO 6% Indicators 2,4; ICCA Confirmed Commitment

U.S. - FIFRA - Listing of Pesticide Chemicals (40 CFR 180)

- Ammonium thiosulfate 7783-18-8 50% TO 60% Section number 180.910
- Ammonium sulfate 7783-20-2 0% TO 6% Section number 180.910

U.S. - FIFRA - Pesticide Product Other Ingredients

- Ammonium sulfate 7783-20-2 0% TO 6% List 4B - Inert Ingredients

United States – Other

U.S. - FDA - Food Additives Generally Recognized as Safe (GRAS)

- Ammonium sulfate 7783-20-2 0% TO 6% 21 CFR 184.1143

U.S. - FDA - Indirect Food Additives

- Ammonium sulfate 7783-20-2 0% TO 6% 21 CFR 177.1200

U.S. - FDA - Total Food Additives List Sourced from EAFUS

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 73.85
- Ammonium sulfate 7783-20-2 0% TO 6% 177.1200, 184.1143, 73.85

U.S. - Coast Guard - Compatibility Groups

- Ammonium thiosulfate 7783-18-8 50% TO 60% Group No. 43 (solution)
- Ammonium sulfate 7783-20-2 0% TO 6% Group No. 43 (solution)

U.S. - Coast Guard - Requirements for Liquid Hazardous Materials

- Ammonium thiosulfate 7783-18-8 50% TO 60% 46 CFR 153.440, 46 CFR 153.908(b) (solution 60% or less)

United States – California – Labor

U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5%

United States – California – Environment

U.S. - California - Air Toxics Hot Spots Act - Emissions Inventory Criteria & Guidelines – App. A-I Substances - ADOA

- Ammonium sulfate 7783-20-2 0% TO 6% 100 lbs/yr ADOA

U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)

- Ammonium sulfate 7783-20-2 0% TO 6% Category IVb

United States – Delaware – Environment

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities

- Ammonium thiosulfate 7783-18-8 50% TO 60% 5000 lb DRQ
- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 5000 lb DRQ

United States – Louisiana - Environment

U.S. - Louisiana - Reportable Quantity List for Pollutants

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 5000 lb final RQ; 2270 kg final RQ

United States – Massachusetts - Environment

U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1 and Category 2

- Ammonium thiosulfate 7783-18-8 50% TO 60% See RCs of any listed constituents
- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% See RCs of any listed constituents

U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity

- Ammonium thiosulfate 7783-18-8 50% TO 60% 100 lb RQ
- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 100 lb RQ

U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1/2

- Ammonium thiosulfate 7783-18-8 50% TO 60% See RCs of any listed constituents
- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% See RCs of any listed constituents

U.S. - Massachusetts - Toxics Use Reduction Act

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% CERCLA Only chemical

United States – Michigan - Environment

U.S. - Michigan - Polluting Materials List

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 500 lb TRQ

United States - New Jersey - Environment

U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5%

United States - New York - Environment

U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% 5000 lb RQ (air); 100 lb RQ (land/water)

United States – Pennsylvania - Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

- Ammonium thiosulfate 7783-18-8 50% TO 60% • Ammonium sulfite(s) 10196-04-0 0.5% TO 5% • Ammonium sulfate 7783-20-2 0% TO 6%

United States - Rhode Island - Labor

U.S. - Rhode Island - Hazardous Substance List

- Ammonium sulfate 7783-20-2 0% TO 6% Flammable

United States – Texas - Other

U.S. - Texas - Effects Screening Levels - Long Term and Short Term

			Long Term	Short Term
• Ammonium thiosulfate	7783-18-8	50% TO 60%	5 µg/m3 ESL	50 µg/m3 ESL
• Ammonium sulfite(s)	10196-04-0	0.5% TO 5%	5 µg/m3 ESL	50 µg/m3 ESL (as Ammonium bisulfite)
• Ammonium sulfate	7783-20-2	0% TO 6%	5 µg/m3 ESL	50 µg/m3 ESL

Canada - Labor

Canada - WHMIS - Classifications of Substances

- Ammonium thiosulfate 7783-18-8 50% TO 60% Uncontrolled product per WHMIS classification criteria (including 60%)
- Ammonium sulfate 7783-20-2 0% TO 6% Uncontrolled product according to WHMIS classification criteria

Canada - WHMIS - Ingredient Disclosure List

- Ammonium sulfate 7783-20-2 0% TO 6% 1 %

Europe - Other

EU - Existing Substance Regulation (793/93/EEC) - Evaluation of Existing HPV Chemicals (REPEALED)

- Ammonium thiosulfate 7783-18-8 50% TO 60%
- Ammonium sulfate 7783-20-2 0% TO 6%

EU - Food Additives (1333/2008/EC) - Annex V - Permitted Food Carriers and Carrier Solvents

- Ammonium sulfate 7783-20-2 0% TO 6%

EU - Food Additives (2008/84/EC) - Specific Purity Criteria for Food Additives Other than Colours and Sweeteners

- Ammonium sulfate 7783-20-2 0% TO 6% E 517

EU - Inventory of Cosmetic Ingredients Directive (INCI) (76/768/EEC) - Other Ingredients

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5% Preservative
- Ammonium sulfate 7783-20-2 0% TO 6% Reducing; Viscosity controlling

Germany - Environment

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

- Ammonium thiosulfate 7783-18-8 50% TO 60% Number 193, hazard class 1 - low hazard to waters
- Ammonium sulfate 7783-20-2 0% TO 6% Number 296, hazard class 1 - low hazard to waters

Other Agency Information - Other

ICCA - High Production Volume Working List

- Ammonium thiosulfate 7783-18-8 50% TO 60%
- Ammonium sulfate 7783-20-2 0% TO 6%

OECD - List of High Production Volume Chemicals

- Ammonium thiosulfate 7783-18-8 50% TO 60% SIDS Chemical
- Ammonium sulfite(s) 10196-04-0 0.5% TO 5%
- Ammonium sulfate 7783-20-2 0% TO 6% SIDS Chemical

OECD - SIDS for HPV Chemicals - Publications Date of SIDS Initial Assessment Reports

- Ammonium sulfate 7783-20-2 0% TO 6% April 2007

OSPAR - List of Substances Considered to Pose Little Risk to the Environment

- Ammonium sulfite(s) 10196-04-0 0.5% TO 5%

Section 16 – Other Information

Responsible for MSDS:	MSDS Coordinator	**Telephone:**	(01)713-920-5362
Address:	Agrifos Fertilizer L.L.C. Pasadena, TX 77501	**Revision Date:**	9 November 2010

National Fire Protection Association (NFPA) 704 Rating:

Health = 1	Reactivity = 0
Flammability = 0	Other = None

Hazardous Materials Identification System (HMIS) Rating:

Health = 1	Reactivity = 1
Flammability = 0	Other = Personal Protection rating to be supplied by the user depending on specific conditions of use.

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