



## Material Safety Data Sheet

**FOR EMERGENCY CALL CHEMTREC – (800) 424-9300**

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Ammonium Sulfate Solution, pH 4.5-6.0

**CAS Number:** Not applicable

**Product Uses**

**Agricultural Industry:** Fertilizer

**Chemical Name:** Not applicable

**Chemical Family:** Not applicable

**Synonyms and Common Trade Names:** None

**Company Identification**

**Manufacturer:** CF Industries, Inc.  
**Address:** 4 Parkway North, Suite 400  
Deerfield, IL 60015-2590  
**Telephone:** 847-405-2400

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

Component Name	Typical Weight Percentage	CAS Number
Water	57-62	7732-18-5
Ammonium Sulfate	33-38	7783-20-2
Ammonium Bisulfate	<4.0	7803-63-6
Ammonium Bisulfite	<1.0	10192-30-3



### 3. HAZARDS IDENTIFICATION

#### **Emergency Overview**

**Danger!** May be harmful if swallowed. Keep container tightly closed. Avoid contact with eyes, skin or clothing. Do not taste or swallow. Wash thoroughly after handling. . Do not acidify solution as sulfur dioxide gas will be emitted.

Clear, colorless liquid.

#### **Potential Health Effects**

**Eyes:** Contact may cause mild eye irritation including stinging, watering, and redness.

**Skin:** Contact may cause mild irritation including redness and a burning sensation. No information regarding skin absorption.

**Inhalation (Breathing):** No information available

**Ingestion (Swallowing):** Low to moderate degree of toxicity by ingestion.

**Signs and Symptoms:** Effects of overexposure may include irritation of the nose and throat and digestive tract, nausea, vomiting, and diarrhea.

**Cancer:** Inadequate data available

**Target Organs:** No data available.

**Developmental:** Inadequate data available.

**Medical Conditions Aggravated by Exposure:** Conditions aggravated by exposure may include skin disorders and respiratory (asthma-like) disorders.

### 4. FIRST AID

**Eyes:** Hold eyelids open and flush eyes immediately with water for at least 15 minutes. Seek medical attention immediately.

**Skin:** Wash affected areas with soap and water. Remove contaminated clothing and shoes. Seek medical attention if irritation develops. Wash clothing before reuse.

**Inhalation:** Remove victim from source and allow to rest in well ventilated area. If breathing is difficult, obtain immediate medical attention.



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**Ingestion:** If person is conscious, immediately give water or milk (about 4 oz. for adults; too much may cause vomiting). Do not induce vomiting. Seek medical attention immediately. If person is unconscious, do not give anything by mouth.

**Notes to Physician:** None known.

## 5. FIRE FIGHTING MEASURES

<b>Flammability:</b>	Ammonium sulfate stripped liquor is not flammable	
<b>Flash Point (test method):</b>	Not applicable.	
<b>Flammable Limits:</b>	Not applicable.	
<b>Explosive Limits:</b>	Not applicable.	
<b>Autoignition Temperature:</b>	Not applicable.	
<b>Extinguishing Media:</b>	Not applicable	
<b>NFPA Fire Rating:</b>	Flammability	0
	Health Hazard	1
	Reactivity	1
	Specific Hazard	May react with acids to evolve sulfur dioxide gas

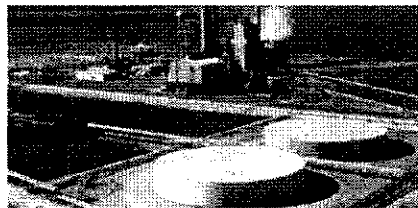
**Key:** Least = 0    Slight = 1    Moderate = 2    High = 3    Extreme = 4

**Fire Fighting Instructions:** For fires involving ammonium sulfate stripped liquor, wear full protective clothing and self-contained breathing apparatus to protect against toxic decomposition products of ammonium sulfate (e.g., nitrous oxides, ammonia and sulfur oxides).

**Unusual Fire and Explosive Hazards:** : If accidentally mixed with oxidizers (e.g., potassium chlorate, ammonium nitrite), there is an explosion hazard during fires.

## 6. ACCIDENTAL RELEASE MEASURES

Cleanup workers should wear appropriate protective clothing (see Section 8). Take immediate steps to contain the spill, if possible, and recover any reusable product. Ventilate area of spill or leak. Specific reporting requirements apply to accidental releases of this compound. Refer to Section 15 (Regulatory Information) for information on these requirements. Dispose of in accordance with federal, state and local regulations.



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**Neutralizing Chemicals:** Neutralize with soda ash. Ammonia will evolve if solution is made alkaline.

## 7. HANDLING AND STORAGE

**Handling:** Wear appropriate personal protective clothing to avoid contact with skin and eyes.

**Storage:** Protect containers from physical damage. Store in a cool, dry, well-ventilated location.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Ventilation:** Use ventilation adequate to keep exposure below recommended limits.

### Preventative Measures / Specific Personal Protective Equipment

**Eyes:** Wear safety glasses if contact with eyes is possible.

**Skin:** Wear impervious, acid-resistant rubber gloves and other protective clothing to prevent contact as appropriate.

**Respiratory:** Protection is not normally required. However, use appropriate respirators when performing certain operations where the solution may contact acid. A respiratory protection program that meets OSHA's 29 CFR 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.

**Other:** Emergency showers and eye-wash fountains should be readily available.



**Exposure Guidelines\***

There are no exposure guidelines available for the product. Available exposure guidelines for the components of this product are listed below:

HAZARDOUS COMPONENTS	% Weight	EXPOSURE GUIDELINE		
		Limits	Agency	Type

Note: Low amounts of sulfur dioxide present until acid is added. This solution will emit sulfur dioxide when acidulated.

Sulfur Dioxide CAS# 7446-09-5	Present	2 ppm 5 ppm	ACGIH ACGIH	TWA STEL
2 ppm	OSHA	TWA		
5 ppm	OSHA	STEL		
5 ppm	MSHA	TWA		
2 ppm	Cal.OSHA	TWA		
5 ppm	Cal.OSHA	STEL		

\*TLV = Threshold Limit Values; PEL = Permissible Exposure Limits;  
IDLH = Immediately Dangerous to Life or Health

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance:</b>	Clear, colorless.
<b>Odor:</b>	Slight sulfur dioxide odor. <b>Note: This solution will emit sulfur dioxide when acidulated.</b>
<b>Odor Threshold Level:</b>	2 ppm SO <sub>2</sub> in air
<b>Physical State:</b>	Liquid
<b>pH:</b>	4.5 – 6.0
<b>Vapor Pressure:</b>	12.2 mm Hg at 20°C
<b>Vapor Density (Air = 1):</b>	Not available.
<b>Boiling point:</b>	110°C
<b>Melting point:</b>	Not available



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<b>Solubility in water:</b>	100%
<b>Specific gravity (H2O = 1):</b>	1.180 - 1.280
<b>Bulk Density:</b>	Not applicable.
<b>Evaporation rate (Butyl acetate = 1):</b>	Not available.
<b>Viscosity:</b>	1.005 centipoise at 25°C
<b>Percentage volatile by volume (%):</b>	57-62% water loss
<b>Molecular weight:</b>	Not applicable
<b>Molecular formula:</b>	Mixture of: Ammonium Sulfate - $(\text{NH}_4)_2\text{SO}_4$ Ammonium Bisulfate - $\text{NH}_4\text{HSO}_4$ Ammonium Bisulfite - $\text{NH}_4\text{HSO}_3$ Sulfuric Acid - $\text{H}_2\text{SO}_4$ (if acidulated)
<b>Water/Oil Distribution Coefficient:</b>	Not applicable

## 10. STABILITY AND REACTIVITY

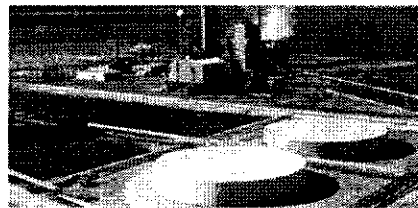
**Stability (thermal, light, etc.):** Stable.

**Conditions to Avoid:** Fire may produce irritating or poisonous gases. Decomposition occurs at temperatures above 280°C.

**Incompatibility (Materials to avoid):** Separate from strong oxidizers such as chlorates, nitrates, and nitrites. There is an explosion hazard during fire if accidentally mixed with potassium chlorate, potassium nitrate or potassium nitrite. A mixture of ammonium sulfate and ammonium nitrate can easily be exploded by potassium or sodium-potassium alloy. Incandescent reaction on heating with potassium chlorate. Reaction with sodium hypochlorite produces the unstable explosive nitrogen trichloride.

**Do not add acid to the ammonium sulfate solution – it will emit sulfur dioxide gas. Prolonged storage will lower the pH and liberate sulfur dioxide gas.**

When adding additional ammonia above a pH of 5.0 a yellow solid (possibly oxides of sulfur) will form in solution. Prolong storage in a mixture of UAN 32 will lower the pH and may liberate sulfur dioxide gas.



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**Hazardous Decomposition Products:** When heated to decomposition, ammonium sulfate emits very toxic fumes of nitrogen oxides, ammonia and sulfur oxides. If heated to a decomposition temperature of 455°F, yields toxic gases, ammonia and sulfur trioxide.

**Hazardous Polymerization:** Will not occur.

**Conditions to Avoid:** Not applicable.

## 11. TOXICOLOGICAL INFORMATION

### **Ammonium Sulfate Solution**

Rat oral LD50 = >2,000 mg/kg (pure ammonium sulfate)

There is no definitive information available on carcinogenicity, mutagenicity, target organs or developmental toxicity for this product.

## 12. ECOLOGICAL INFORMATION

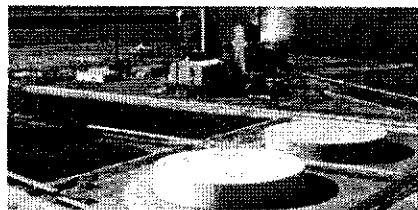
No ecological data are available for ammonium sulfate solution; however, based on its pH, it may be harmful to aquatic and terrestrial biota.

The following ecological data are for ammonium sulfate and sulfuric acid. Notify local health and wildlife officials and operators of any nearby water intakes upon contamination.

### **Ecotoxicity Information:**

#### **Ammonium Sulfate**

In fresh water, the 96-hour TL<sub>m</sub> is 1290 ppm for mosquitofish and 292 ppm for *Daphnia magna*. The 24-hour TL<sub>m</sub> for *Daphnia magna* is 423 ppm (conditions of bioassay not specified). For two species of freshwater snails, the 24-hour LC<sub>50</sub>'s are 558 ppm and 669 ppm for eggs, 393 ppm and 526 ppm for juveniles, and 657 ppm and 701 ppm for adults. Following a 48-hour exposure, the ammonium sulfate concentrations which produced 100% mortality in two species of snails were 1000 ppm and 1250 ppm.



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## **Environmental Fate Information:**

### **Ammonium Sulfate**

Ammonium sulfate is not expected to biomagnify in the food chain.

## **13. DISPOSAL CONSIDERATIONS**

Ammonium sulfate solution is not considered a hazardous waste under Federal Hazardous Waste Regulations 40 CFR 261. Consult local, state or federal environmental regulatory agencies for acceptable disposal procedures and locations. Follow standard disposal procedures.

## **14. TRANSPORT INFORMATION**

Ammonium sulfate solution is not listed as a hazardous material by the U.S. Department of Transportation (DOT), Transport Canada (TC), the International Maritime Organization (IMO) or the United Nations (UN).

**Proper Shipping Name:** Chemicals, N.O.S. (non-regulated)

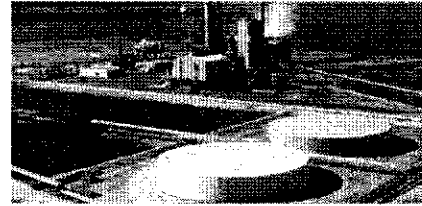
## **15. REGULATORY INFORMATION**

The following regulatory information is provided for ammonium sulfate and sulfuric acid.

**OSHA (Occupational Safety and Health Administration):** Ammonium sulfate solution is considered to be hazardous as defined by the OSHA Hazard Communication Standard.

**SARA TITLE III (Superfund Amendment and Reauthorization Act of 1986):** This product contains the following toxic chemicals subject to the reporting requirements of Section 302 and/or Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:





CAS No.	Chemical Name	Amount of Chemical in CFI Product (% by weight)	302 Threshold Planning Quantity for Chemical (lbs.)	313 De Minimis Concentration (% by weight)
7783-20-2	Ammonium Sulfate	33-38	Not Listed	1.0

**Sections 311/312:** Ammonium sulfate has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of SARA Title III and is considered, under applicable definitions, to meet the following categories::

Acute: yes    Chronic: no    Fire: no    Reactivity: no

**DOT (Department of Transportation):** Please refer to Section 14 (Transport Information) for guidance concerning transportation.

Ammonium sulfate is regulated by the following states: Massachusetts, New Jersey and Pennsylvania.

This material has not been identified as a carcinogen by NTP, IARC or OSHA.

**Proposition 65:** NOT LISTED

**16. DOCUMENTARY INFORMATION AND DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

Preparation Date:     January 22, 2008  
 Issue Date:           January 22, 2008  
 Previous Issue Date:   Not applicable

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