SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Ammonium sulfate
Product Number : A4418
Brand : Sigma
CAS-No. : 7783-20-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO  63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Short-term (acute) aquatic hazard (Category 3), H402
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram : none
Signal Word : none
Hazard statement(s) : Harmful to aquatic life.
H402
Precautionary statement(s) : Avoid release to the environment.
P273 : Dispose of contents/ container to an approved waste disposal
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances
Synonyms : Ammonium sulphate

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ammonium sulphate</td>
<td>Aquatic Acute 3; H402</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

If inhaled
After inhalation: fresh air.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Nitrogen oxides (NOx)
Sulfur oxides
Not combustible.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid inhalation of dusts. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Tightly closed. Dry.

Storage class
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.
8.2 Exposure controls

Appropriate engineering controls
Change contaminated clothing. Wash hands after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

Respiratory protection
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance
   Form: crystalline
   Color: colorless

b) Odor
   odorless

c) Odor Threshold
   Not applicable

d) pH
   5.0 - 6 at 132 g/l at 25 °C (77 °F)

e) Melting point/freezing point
   Melting point/range: > 280 °C (> 536 °F) - dec.
f) Initial boiling point and boiling range Not applicable

g) Flash point No data available

h) Evaporation rate No data available

i) Flammability (solid, gas) The product is not flammable.

j) Upper/lower flammability or explosive limits No data available

k) Vapor pressure < 0.1 hPa at 25 °C (77 °F)

l) Vapor density Not applicable

m) Density 1.77 g/cm³ at 25 °C (77 °F) - lit.
   Relative density No data available

n) Water solubility 767 g/l at 25 °C (77 °F)

o) Partition coefficient: n-octanol/water Not applicable for inorganic substances

p) Autoignition temperature No data available

q) Decomposition temperature > 235 °C (> 455 °F) -

r) Viscosity No data available

s) Explosive properties No data available

t) Oxidizing properties none

9.2 Other safety information

Solubility in other solvents
   Ethanol - insoluble
   Acetone - insoluble

Relative vapor density Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Exothermic reaction with:
   chlorates with heat
   nitrates with Heat.
Risk of explosion with:
chlorates
with
Acids
nitrates
with
Potassium
nitrates
with
Acids
nitrites
sodium hypochlorite
Generates dangerous gases or fumes in contact with:
alkalines
Possible formation of:
Ammonia

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 4,250 mg/kg
(OECD Test Guideline 401)
Inhalation: No data available
LD50 Dermal - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 434)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 20 h
Remarks: (ECHA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
Remarks: (ECHA)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(US-EPA)

Germ cell mutagenicity
Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: Mutagenicity (mammal cell test): chromosome aberration.
Test system: Human lymphocytes
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal

Remarks: (ECHA)

**Carcinogenicity**

IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male - Oral - NOAEL (No observed adverse effect level) - 256 mg/kg

RTECS: BS4500000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

The following applies to ammonium salts in general: after swallowing: local irritation symptoms, nausea, vomiting, diarrhoea. Systemic effect: after the uptake of very large quantities: drop in blood pressure, collapse, CNS disorders, spasms, narcotic conditions, respiratory paralysis, haemolysis.

Handle in accordance with good industrial hygiene and safety practice.
### SECTION 12: Ecological information

#### 12.1 Toxicity

<table>
<thead>
<tr>
<th>Type of Test</th>
<th>Substance</th>
<th>EC50/ErC50</th>
<th>Time/Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>Oncorhynchus mykiss (rainbow trout)</td>
<td>LC50</td>
<td>53 mg/l - 96 h</td>
</tr>
<tr>
<td>Remarks:</td>
<td>(ECHA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>Ceriodaphnia (water flea)</td>
<td>EC50</td>
<td>121.7 mg/l - 48 h</td>
</tr>
<tr>
<td>Remarks:</td>
<td>(US-EPA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>Chlorella vulgaris (Fresh water algae)</td>
<td>ErC50</td>
<td>2,700 mg/l - 18 Days</td>
</tr>
<tr>
<td>Remarks:</td>
<td>(ECHA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxicity to bacteria</td>
<td>activated sludge</td>
<td>EC50</td>
<td>1,618 mg/l - 30 min</td>
</tr>
<tr>
<td>Remarks:</td>
<td>(OECD Test Guideline 209)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxicity to fish (Chronic toxicity)</td>
<td>Lepomis macrochirus</td>
<td>EC10</td>
<td>5.29 mg/l - 30 d</td>
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<tr>
<td>Remarks:</td>
<td>(ECHA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)</td>
<td>Daphnia</td>
<td>EC10</td>
<td>3.12 mg/l - 70 d</td>
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<tr>
<td>Remarks:</td>
<td>(US-EPA)</td>
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</tr>
</tbody>
</table>

#### 12.2 Persistence and degradability

The methods for determining biodegradability are not applicable to inorganic substances.

#### 12.3 Bioaccumulative potential

No data available

#### 12.4 Mobility in soil

No data available

#### 12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

#### 12.6 Endocrine disrupting properties

No data available

#### 12.7 Other adverse effects

**Biological effects:**

Fertilising effect possible.

Discharge into the environment must be avoided.

### SECTION 13: Disposal considerations

#### 13.1 Waste treatment methods

**Product**

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned.
containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

Further information
Not classified as dangerous in the meaning of transport regulations.

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
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<th>CAS-No.</th>
<th>Revision Date</th>
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<tbody>
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<td>ammonium sulphate</td>
<td>7783-20-2</td>
<td>1993-04-24</td>
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</table>

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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SECTION 16: Other information

Further information
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See