Safety Data Sheet

Material Name: ALUMINUM SULFATE, SOLUTION

* * * Section 1 - PRODUCT AND COMPANY IDENTIFICATION * * *

Synonyms
USALCO ALUM, ALUM

Material Name: ALUMINUM SULFATE, SOLUTION

Manufacturer Information
USALCO, LLC
1120 Middle River Rd.
Baltimore, MD 21220

Emergency # 1-800-424-9300 (CHEMTREC)

Chemical Family
inorganic, salt

Product Use
water treatment coagulant, floculant, alumina source for catalyst, pH control in papermaking/water treatment

* * * Section 2 - HAZARDS IDENTIFICATION * * *

EMERGENCY OVERVIEW
Color: colorless to amber, colorless to green
Physical Form: liquid
Odor: odorless
Health Hazards: respiratory tract irritation, skin irritation, eye irritation

POTENTIAL HEALTH EFFECTS

Inhalation
Short Term: irritation, cough, sore throat
Long Term: irritation, difficulty breathing, wheezing, lung damage

Skin
Short Term: irritation (possibly severe), allergic reactions
Long Term: irritation (possibly severe), allergic reactions

Eye
Short Term: irritation (possibly severe)
Long Term: irritation (possibly severe)

Ingestion
Short Term: digestive disorders
Long Term: no information is available

* * * Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS * * *

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component</th>
<th>Percent</th>
<th>Symbol(s)</th>
<th>Risk Phrase(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10043-01-3</td>
<td>ALUMINUM SULFATE</td>
<td>&lt;50</td>
<td>Xi</td>
<td>R:36-37-38</td>
</tr>
<tr>
<td>233-135-0</td>
<td>231-791-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7732-18-5</td>
<td>WATER</td>
<td>&gt;50</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

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Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Aluminium compounds.

*** Section 4 - FIRST AID MEASURES ***

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin
Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eyes
Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Ingestion
If a large amount is swallowed, get medical attention.

*** Section 5 - FIRE FIGHTING MEASURES ***

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Flammable Properties
Negligible fire hazard.

Extinguishing Media
Use extinguishing agents appropriate for surrounding fire.

Fire Fighting Measures
Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Thermal Decomposition Products
Combustion: oxides of sulfur

Sensitivity to Mechanical Impact
Not sensitive

Sensitivity to Static Discharge
Not sensitive

*** Section 6 - ACCIDENTAL RELEASE MEASURES ***

Occupational spill/release
Stop leak if possible without personal risk. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
** *** Section 7 - HANDLING AND STORAGE *** **

**Handling Procedures**
Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

**Storage Procedures**
Store and handle in accordance with all current regulations and standards. Store with acids. See original container for storage recommendations. Keep separated from incompatible substances.

** *** Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION *** **

**Component Exposure Limits**
ACGIH and EU have not developed exposure limits for any of this product's components.

**Ventilation**
Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT**

**Eyes/Face**
Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

**Protective Clothing**
Wear appropriate chemical resistant clothing.

**Glove Recommendations**
Wear appropriate chemical resistant gloves.

**Respiratory Protection**
Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

Any air-purifying full-facepiece respirator equipped with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100 or P100.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

**For Unknown Concentrations or Immediately Dangerous to Life or Health** -
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

*** *** Section 9 - PHYSICAL AND CHEMICAL PROPERTIES *** ***
**Physical State:** Liquid  
**Color:** colorless to amber, colorless to green  
**Odor:** odorless  
**pH:** 2.0 (approximate)  
**Boiling Point:** 100 °C @ 760 mmHg (approximate)  
**Evaporation Rate:** 1 (water=1)  
**Vapor Density (air = 1):** 0.62 (approximate)  
**Specific Gravity (water = 1):** 1.32 - 1.34 @ 16 °C  
**Coeff. Water/Oil Dist:** Not available  
**Vap. Pressure:** Not available  
**Vap. Density (air = 1):** Not available  
**Density:** 11.1 lbs/gal @ 16 °C  
**Specific Gravity (water = 1):** 1.32 - 1.34 @ 16 °C  
**Water Solubility:** soluble  
**Viscosity:** Not available

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**Section 10 - STABILITY AND REACTIVITY**

**Chemical Stability**
Stable at normal temperatures and pressure.

**Conditions to Avoid**
Protect from freezing. Keep separated from incompatible substances.

**Materials to Avoid**
- alkalis, metals
- ALUMINUM SULFATE: BASES: Violent reaction. METALS: May be corrosive in the presence of moisture.

**Thermal Decomposition Products**
Combustion: oxides of sulfur

**Possibility of Hazardous Reactions**
Will not polymerize.

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**Section 11 - TOXICOLOGICAL INFORMATION**

**Component Analysis - LD50/LC50**
The components of this material have been reviewed in various sources and the following selected endpoints are published:

- **ALUMINUM SULFATE (10043-01-3)**
  Oral LD50 Rat: 1930 mg/kg

- **WATER (7732-18-5)**
  Oral LD50 Rat: >90 mL/kg
RTECS Acute Toxicity (selected)
The components of this material have been reviewed, and RTECS publishes the following endpoints:

**ALUMINUM SULFATE (10043-01-3)**
- Oral: 6207 mg/kg oral mouse LD50
- WATER (7732-18-5)
  - Oral: >90 ml/kg oral rat LD50

**Acute Toxicity Level**
**ALUMINUM SULFATE (10043-01-3)**
Slightly Toxic: ingestion.

**Component Carcinogenicity**
None of this product's components are listed by ACGIH, IARC, or DFG.

**RTECS Irritation**
The components of this material have been reviewed, and RTECS publishes the following endpoints:

**ALUMINUM SULFATE (10043-01-3)**
10 mg/24 hour(s) eyes rabbit severe

**Local Effects**
**ALUMINUM SULFATE (10043-01-3)**
Irritant: inhalation, skin, eye.

**RTECS Mutagenic**
The components of this material have been reviewed, and RTECS publishes the following endpoints:

**ALUMINUM SULFATE (10043-01-3)**
- Micronucleus test human lymphocyte 20 mg/L; sister chromatid exchange human lymphocyte 20 mg/L; other mutation test systems human lymphocyte 20 mg/L; cytogenetic analysis human lymphocyte 20 mg/L; cytogenetic analysis rat oral 762 mg/kg/7 day(s) continuous; other mutation test systems rat oral 762 mg/kg/7 day(s) continuous

**RTECS Reproductive Effects**
The components of this material have been reviewed, and RTECS publishes the following endpoints:

**ALUMINUM SULFATE (10043-01-3)**
800 mg/kg intraperitoneal mouse TDLo (pregnant female 10-13 day(s), continuous); 27371 ug/kg subcutaneous mouse TDLo (male 30 day(s)); 27371 ug/kg intratesticular rat TDLo (male 1 day(s))

**HEALTH EFFECTS**

**Inhalation - Acute Exposure**
**ALUMINUM SULFATE**: Inhalation may cause irritation of mucous membranes with sore throat and cough due to sulfuric acid which is formed by the hydrolysis of the salt upon contact with moisture.

**Inhalation - Chronic Exposure**
**ALUMINUM SULFATE**: Repeated or prolonged exposure may cause bronchial irritation, leading to nocturnal wheezing, and breathlessness. Prolonged inhalation of dusts containing high concentrations of aluminum have produced emphysema, non-nodular pulmonary fibrosis and fatalities.

**Skin Contact - Acute Exposure**
**ALUMINUM SULFATE**: Aluminum sulfate hydrolyzes readily with moisture to form some sulfuric acid which may produce irritation, dermatoses and eczema. Excessive formation of sulfuric acid may produce possible burns. Aluminum sulfate may rarely cause skin sensitization.
Skin Contact - Chronic Exposure
ALUMINUM SULFATE: Repeated or prolonged contact with some soluble salts of aluminum results in acid irritation from hydrolysis. A congestive, anesthetic condition of the fingers (acroanesthesia) may occur from prolonged contact. Repeated exposure may result in sensitization.

Eye Contact - Acute Exposure
ALUMINUM SULFATE: May cause irritation, redness, and corneal burns due to the reaction of the compound with moisture to form sulfuric acid.

Eye Contact - Chronic Exposure
ALUMINUM SULFATE: Repeated or prolonged contact with irritants may cause conjunctivitis or effects similar to those for acute exposure.

Ingestion - Acute Exposure
ALUMINUM SULFATE: Ingestion of a large dose was lethal in mice. Aluminum salts, particularly concentrated solutions (20%), may produce gingival necrosis and fatal hemorrhagic gastroenteritis, incoordination, clonic contractions, evidence of nephritis and death.

Ingestion - Chronic Exposure
ALUMINUM SULFATE: No data available.

*** Section 12 - ECOLOGICAL INFORMATION ***

Component Analysis - Aquatic Toxicity
ALUMINUM SULFATE (10043-01-3)
Fish: 96 Hr LC50 Carassius auratus: 100 mg/L; 96 Hr LC50 Gambusia affinis: 37 mg/L [static]
Invertebrate: 15 Min EC50 Daphnia magna: 136 mg/L

*** Section 13 - DISPOSAL CONSIDERATIONS ***

Disposal Methods
Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D002.

Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components.

*** Section 14 - TRANSPORT INFORMATION ***

US DOT Information
Shipping Name: Environmentally hazardous substances, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN/NA #: UN3082 Hazard Class: 9 Packing Group: III Required Label(s): 9

TDG Information
Shipping Name: Environmentally hazardous substance, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN #: UN3082 Hazard Class: 9 Packing Group: III Required Label(s): 9
ADR Information

Shipping Name: Environmentally hazardous substance, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN #: UN3082  Hazard Class: 9  Packing Group: III
Required Label(s): 9

RID Information

Shipping Name: Environmentally hazardous substance, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN #: UN3082  Hazard Class: 9  Packing Group: III
Required Label(s): 9

IATA Information

Shipping Name: Environmentally hazardous substance, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN #: UN3082  Hazard Class: 9  Packing Group: III
Required Label(s): 9

ICAO Information

Shipping Name: Environmentally hazardous substance, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN #: UN3082  Hazard Class: 9  Packing Group: III
Required Label(s): 9

IMDG Information

Shipping Name: Environmentally hazardous substance, liquid, n.o.s. (Contains: ALUMINUM SULFATE, SOLUTION)
UN #: UN3082  Hazard Class: 9  Packing Group: III

*** Section 15 - REGULATORY INFORMATION ***

U.S. Federal Regulations

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 311/312 (40 CFR 370.21), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

ALUMINUM SULFATE (10043-01-3)

CERCLA:  5000 lb final RQ; 2270 kg final RQ
SARA Section 311/312 (40 CFR 370 Subparts B and C)
Acute Health: Yes  Chronic Health: No  Fire: No  Pressure: No  Reactive: No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:

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<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
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<tbody>
<tr>
<td>ALUMINUM SULFATE</td>
<td>10043-01-3</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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</tbody>
</table>
Not regulated under California Proposition 65

Germany Water Classification
ALUMINUM SULFATE (10043-01-3)
Number 486, hazard class 1 - low hazard to waters (footnote 8)

EU Marking and Labelling
Symbols
Xi irritant

Risk Phrases
R36/37/38 Irritating to eyes, respiratory system and skin.

Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>US</th>
<th>CA</th>
<th>EU</th>
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<tbody>
<tr>
<td>ALUMINUM SULFATE</td>
<td>10043-01-3</td>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
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<td>Yes</td>
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<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<td>Yes</td>
</tr>
</tbody>
</table>

*** Section 16 - OTHER INFORMATION ***

Key / Legend
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Full text of R phrases in Section 3
R36 Irritating to eyes.
R37 Irritating to respiratory system.
R38 Irritating to skin.
Other Information

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