SECTION 1: IDENTIFICATION

Product Identifier

Product Form: Substance
Product Name: Dry Alum
CAS No: 16828-12-9
Formula: Al₂(SO₄)₃●14 H₂O

Intended Use of the Product

Alum is used as a coagulating agent in municipal and industrial water and wastewater treatment and as an additive in papermaking.

Name, Address, and Telephone of the Responsible Party

Manufacturer
CHEMTRADE LOGISTICS INC.
155 Gordon Baker Road
Suite 300
Toronto, Ontario M2H 3N5
For SDS Info: (416) 496-5856
www.chemtradelogistics.com

Emergency Telephone Number

Canada: CANUTEC +1-613-996-6666 / US: CHEMTREC +1-800-424-9300
INTERNATIONAL: +1-703-741-5970
Chemtrade Emergency Contact: (866) 416-4404
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

GHS Classification
Skin Irrit. 2  H315
Eye Irrit. 2A  H319
STOT SE 3  H335
Aquatic Acute 3  H402
Aquatic Chronic 3  H412

Full text of hazard classes and H-statements : see section 16

Label Elements

GHS Labeling
Hazard Pictograms

Signal Word : Warning

Hazard Statements : H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H335 - May cause respiratory irritation.
H402 - Harmful to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary Statements : P261 - Avoid breathing dust.
P264 - Wash hands, forearms, and other exposed areas thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, protective clothing, and eye protection.
P302+P352 - IF ON SKIN: Wash with plenty of water.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for
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breathing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 - Call a POISON CENTER or doctor if you feel unwell.
P321 - Specific treatment (see section 4 on this SDS).
P332+P338 - If skin irritation occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P362+P364 - Take off contaminated clothing and wash it before reuse.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Other Hazards
Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

Unknown acute toxicity
No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance</th>
<th>Product Identifier</th>
<th>%*</th>
<th>GHS Ingredient Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum sulfate</td>
<td>(CAS No) 16828-12-9</td>
<td>100</td>
<td>Skin Irrit. 2, H315</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STOT SE 3, H335</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Acute 3, H402</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Chronic 3, H412</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

*Percentages are listed in weight by weight percentage (w/w%) for liquid and solid ingredients. Gas ingredients are listed in volume by volume percentage (v/v%).

SECTION 4: FIRST AID MEASURES

Description of First-aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

Skin Contact: Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

Eye Contact: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention.

Ingestion: Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

Most Important Symptoms and Effects Both Acute and Delayed

General: Causes serious eye irritation. Causes skin irritation. May cause respiratory irritation.

Inhalation: Irritation of the respiratory tract and the other mucous membranes.

Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.

Eye Contact: Contact causes severe irritation with redness and swelling of the conjunctiva.

Ingestion: Ingestion may cause adverse effects.

Chronic Symptoms: None expected under normal conditions of use.

Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Water spray, dry chemical, foam, carbon dioxide.
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Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special Hazards Arising From the Substance or Mixture
- Fire Hazard: Not considered flammable but may burn at high temperatures.
- Explosion Hazard: Product is not explosive.
- Reactivity: Hazardous reactions will not occur under normal conditions.

Advice for Firefighters
- Precautionary Measures Fire: Exercise caution when fighting any chemical fire.
- Firefighting Instructions: Use water spray or fog for cooling exposed containers.
- Protection During Firefighting: Do not enter fire area without proper protective equipment, including respiratory protection.
- Hazardous Combustion Products: Forms aluminum oxide, sulfur dioxide and/or sulfur trioxide at temperatures above 760°C (1400°F) or when dry alum is encompassed in a fire involving other burning materials. The decomposition products are corrosive and hazardous to health.
- Other Information: Do not allow run-off from fire fighting to enter drains or water courses.

Reference to Other Sections
Refer to Section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
- General Measures: Avoid breathing dust. Avoid all contact with skin, eyes, or clothing.
- For Non-Emergency Personnel
  - Protective Equipment: Use appropriate personal protective equipment (PPE).
- For Emergency Personnel
  - Protective Equipment: Equip cleanup crew with proper protection.
  - Emergency Procedures: Upon arrival at the scene, a first responder is expected to recognize the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit.
- Ventilate area.

Environmental Precautions
Prevent entry to sewers and public waters. Avoid release to the environment.

Methods and Materials for Containment and Cleaning Up
- For Containment: Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams.
- Methods for Cleaning Up: Clean up spills immediately and dispose of waste safely. Recover the product by vacuuming, shoveling or sweeping. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

Reference to Other Sections
See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling
- Precautions for Safe Handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid breathing dust. Avoid contact with skin, eyes and clothing. Avoid contact with eyes, skin and clothing.
- Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures.

Conditions for Safe Storage, Including Any Incompatibilities
- Technical Measures: Comply with applicable regulations.
- Storage Conditions: Keep container closed when not in use. Store in a dry, cool place. Keep/Store away from extremely high or low temperatures and incompatible materials.
- Incompatible Materials: Non acid-proof metals (such as aluminum, copper and iron), bases, unalloyed steel, galvanized surfaces.

Specific End Use(s)
Alum is used as a coagulating agent in municipal and industrial water and wastewater treatment and as an additive in papermaking.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters
For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), AIHA (WEEL), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.
Exposure Controls
Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Ensure adequate ventilation, especially in confined areas. Ensure all national/local regulations are observed.

Personal Protective Equipment: Gloves. Protective clothing. Protective goggles or safety glasses.

Materials for Protective Clothing: Chemically resistant materials and fabrics.
Hand Protection: Wear protective gloves.
Eye Protection: Chemical safety goggles or safety glasses.
Skin and Body Protection: Wear suitable protective clothing.
Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.
Other Information: When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES
Information on Basic Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Appearance</td>
<td>White to off-white powder, granules</td>
</tr>
<tr>
<td>Odor</td>
<td>Not available</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>&gt;2.9 @ 5%</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting Point</td>
<td>86 °C (186.8°F)</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>117 °C (242.6°F)</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Lower Flammable Limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper Flammable Limit</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Vapor Density at 20°C</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Water: Complete</td>
</tr>
<tr>
<td>Partition Coefficient: N-Octanol/Water</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY
Reactivity: Hazardous reactions will not occur under normal conditions.
Chemical Stability: Stable under recommended handling and storage conditions (see section 7).
Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
Conditions to Avoid: Extremely high or low temperatures and incompatible materials.
Incompatible Materials: Non acid-proof metals (such as aluminum, copper and iron), bases, unalloyed steel, galvanized surfaces.
Hazardous Decomposition Products: None expected under normal conditions of use.
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SECTION 11: TOXICOLOGICAL INFORMATION

Information on Toxicological Effects - Product

- Acute Toxicity (Oral): Not classified
- Acute Toxicity (Dermal): Not classified
- Acute Toxicity (Inhalation): Not classified
- LD50 and LC50 Data: Not available
- Skin Corrosion/Irritation: Causes skin irritation.
  pH: >2.9 @ 5%
- Eye Damage/Irritation: Causes serious eye irritation.
  pH: >2.9 @ 5%
- Respiratory or Skin Sensitization: Not classified
- Germ Cell Mutagenicity: Not classified
- Carcinogenicity: Not classified
- Specific Target Organ Toxicity (Repeated Exposure): Not classified
- Reproductive Toxicity: Not classified
- Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.
- Aspiration Hazard: Not classified
- Symptoms/Effects After Inhalation: Irritation of the respiratory tract and the other mucous membranes.
- Symptoms/Effects After Skin Contact: Redness, pain, swelling, itching, burning, dryness, and dermatitis.
- Symptoms/Effects After Eye Contact: Contact causes severe irritation with redness and swelling of the conjunctiva.
- Symptoms/Effects After Ingestion: Ingestion may cause adverse effects.
- Chronic Symptoms: None expected under normal conditions of use.

Information on Toxicological Effects - Ingredient(s)

- LD50 and LC50 Data: Not available

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

- Ecology - General: Harmful to aquatic life with long lasting effects. Harmful to aquatic life.

Persistence and Degradability

| Dry Alum (16828-12-9) | Persistence and Degradability | May cause long-term adverse effects in the environment. |

Bioaccumulative Potential

| Dry Alum (16828-12-9) | Bioaccumulative Potential | Not established. |

Mobility in Soil: Not available

Other Adverse Effects

- Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Recommendations: Dispose of contents/container in accordance with local, regional, national, territorial, provincial, and international regulations.

Additional Information: Container may remain hazardous when empty. Continue to observe all precautions.

Ecology - Waste Materials: Avoid release to the environment. This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

Not regulated for transport according to: US DOT, IMDG, IATA, and Canada’s TDG.
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### SECTION 15: REGULATORY INFORMATION

#### US Federal Regulations

<table>
<thead>
<tr>
<th>Chemical Name (CAS No.)</th>
<th>CERCLA RQ</th>
<th>EPCRA 304 RQ</th>
<th>SARA 302 TPQ</th>
<th>SARA 313</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum sulfate (16828-12-9)</td>
<td>Not present</td>
<td>Not present</td>
<td>Not present</td>
<td>No</td>
</tr>
</tbody>
</table>

**SARA 311/312**

Dry Alum (16828-12-9)
Immediate (acute) health hazard

#### US TSCA Flags

Not present

#### US State Regulations

**California Proposition 65**

<table>
<thead>
<tr>
<th>Chemical Name (CAS No.)</th>
<th>Carcinogenicity</th>
<th>Developmental Toxicity</th>
<th>Female Reproductive Toxicity</th>
<th>Male Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum sulfate (16828-12-9)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**State Right-To-Know Lists**

<table>
<thead>
<tr>
<th>Aluminum sulfate (16828-12-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - Massachusetts - Right To Know List - No</td>
</tr>
<tr>
<td>U.S. - New Jersey - Right to Know Hazardous Substance List - No</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List - No</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances - No</td>
</tr>
<tr>
<td>U.S. - Pennsylvania - RTK (Right to Know) List - No</td>
</tr>
</tbody>
</table>

#### Canadian Regulations

Aluminum sulfate (16828-12-9)

Listed on the Canadian DSL (Domestic Substances List)*Anhydrous form is listed on the DSL as (10042-01-3)
Not listed on the Canadian NDSL (Non-Domestic Substances List)

#### International Inventories/Lists

<table>
<thead>
<tr>
<th>Chemical Name (CAS No.)</th>
<th>Australia AICS</th>
<th>Turkey CICR</th>
<th>Korea ECL</th>
<th>EU EINECS</th>
<th>EU ELINCS</th>
<th>EU SVHC</th>
<th>EU NLP</th>
<th>Mexico INSQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum sulfate (16828-12-9)*Anhydrous form as (10043-01-3)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name (CAS No.)</th>
<th>China IECSC</th>
<th>Japan ENCS</th>
<th>Japan ISHL</th>
<th>Japan PDSCL</th>
<th>Japan PRTR</th>
<th>Philippines PICCS</th>
<th>New Zealand NZIOC</th>
<th>US TSCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum sulfate (16828-12-9)*Anhydrous form as (10043-01-3)</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

**Revision Date**: 04/16/2018

**Other Information**: This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200 and Canada’s Hazardous Products Regulations (HPR).

**Revision Summary**

<table>
<thead>
<tr>
<th>Section</th>
<th>Change</th>
<th>Date Changes</th>
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<tbody>
<tr>
<td>15</td>
<td>International Inventories/List</td>
<td>04/16/2018</td>
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</tbody>
</table>
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### GHS Full Text Phrases:

<table>
<thead>
<tr>
<th>GHS Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H412</td>
<td>Harmful to aquatic life with long lasting effects</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
<tr>
<td>H402</td>
<td>Harmful to aquatic life</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity (single exposure) Category 3</td>
</tr>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation Category 2A</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/irritation Category 2</td>
</tr>
<tr>
<td>Aquatic Chronic 3</td>
<td>Hazardous to the aquatic environment - Chronic Hazard Category 3</td>
</tr>
<tr>
<td>Aquatic Acute 3</td>
<td>Hazardous to the aquatic environment - Acute Hazard Category 3</td>
</tr>
<tr>
<td>H11</td>
<td>Chemical may cause severe eye irritation</td>
</tr>
<tr>
<td>H224</td>
<td>Causes severe respiratory irritation</td>
</tr>
<tr>
<td>H274</td>
<td>May cause persistent or long lasting effects to aquatic life</td>
</tr>
</tbody>
</table>

### Abbreviations and Acronyms

- **AICS**: American Conference of Governmental Industrial Hygienists
- **ACGIH**: American Conference of Governmental Industrial Hygienists
- **AIHA**: American Industrial Hygiene Association
- **DOT**: US Department of Transportation – Code of Federal Regulations
- **OECD**: Organisation for Economic Co-operation and Development
- **OSHA**: Occupational Safety and Health Administration
- **PRTR**: Japan Pollutant Release and Transfer Register
- **SARA**: Superfund Amendments and Reauthorization Act
- **TSCA**: Toxic Substances Control Act

### NFPA 704

- **NFPA Health Hazard**: 0 - Minimal Hazard, 1 - Moderate Hazard, 2 - Severe Hazard, 3 - Extreme Hazard
- **NFPA Fire Hazard**: 0 - Minimal Hazard, 1 - Precautionary, 2 - Moderate Hazard, 3 - Severe Hazard
- **NFPA Reactivity Hazard**: 0 - Minimal Reactivity, 1 - Precipitation, 2 - Reactivity with Water, 3 - Reactivity with Water

### HMIS Rating

- **Health**: 0 Minimal Hazard, 1 Moderate Hazard, 2 Severe Hazard, 3 Extreme Hazard
- **Flammability**: 0 Minimal Flammability, 1 Precautionary, 2 Flammable, 3 Combustible
- **Physical**: 0 Minimal Physical Hazard, 1 Precautionary, 2 Hazardous, 3 Extreme Hazard
- **PPE**: See Section 8

### NFPA 704 Ratings

- **Health**: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
- **Flammability**: 1 - Materials that must be preheated before ignition can occur.
- **Reactivity**: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.
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IMDG - International Maritime Dangerous Goods Code
INSQ - Mexican National Inventory of Chemical Substances
TWA - Time Weighted Average
WEEL - Workplace Environmental Exposure Levels

Handle product with due care and avoid unnecessary contact. This information is supplied under U.S. OSHA’S “Right to Know” (29 CFR 1910.1200) and Canada’s WHMIS regulations. Although certain hazards are described herein, we cannot guarantee these are the only hazards that exist. The information contained herein is based on data available to us and is believed to be true and accurate but it is not offered as a product specification. No warranty, expressed or implied, regarding the accuracy of this data, the hazards connected with the use of the product, or the results to be obtained from the use thereof, is made and Chemtrade and its affiliates assume no responsibility. Chemtrade is a member of the CIAC (Chemistry Industry Association of Canada) and adheres to the codes and principles of Responsible Care™.