MATERIAL SAFETY DATA SHEET
Aluminum Chlorohydrate

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer’s Name and Address:
ALTIVIA Chemicals, LLC
1100 Louisiana, Ste. 4800
Houston, TX 77002
USA • (713) 658-9000
24 Hour Emergency – Chemtrec (800) 424-9300

PRODUCT NAME: Aluminum Chlorohydrate
CHEMICAL NAME/ FAMILY: Metal Salts
SYNONYMS: Aluminum Chlorohydrate, Polyaluminum Chloride, Aluminum Chlorohydroxide
MOLECULAR FORMULA: Alₙ(OH)ₘCl₃ₙ₋ₘ
PRODUCT USE: Coagulant/ Flocculant
MANUFACTURER: ALTIVIA Chemicals, LLC, 1100 Louisiana, Suite 4800, Houston, TX 77002

SECTION 2: COMPOSITION/ INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS NUMBER</th>
<th>% RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum Chlorohydrate</td>
<td>12042-91-0</td>
<td>&lt; 50%</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>Balance</td>
</tr>
</tbody>
</table>

* Denotes chemical subject to reporting requirements of Section 313 of Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Clear to slightly hazy, colorless to amber liquid with no appreciable odor. CAUTION! May cause skin, eye and respiratory irritation. May be harmful if swallowed.

POTENTIAL HEALTH EFFECTS

EYE
May cause irritation with redness and swelling. Prolonged exposure may cause conjunctivitis.

SKIN
Possible irritant. May cause irritation, especially on prolonged contact.

**INGESTION**
May be harmful if swallowed. Irritation of the mouth and stomach. May cause nausea, vomiting, and diarrhea.

**INHALATION**
Inhalation of mist or spray may cause irritation to the mucous membranes.

**SIGNS AND SYMPTOMS OF EXPOSURE**
Irritation to exposed tissue. Nausea, vomiting, stomach cramps, diarrhea.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**
No available information for the product.

**EFFECTS FOLLOWING REPEATED EXPOSURE**
This product is expected to be an irritant to the skin, eyes and mucous membrane. Irritation may become severe on prolonged contact. Persons with kidney disorders have an increased risk from exposure based on general information found on aluminum salts.

### SECTION 4: FIRST AID MEASURES

**EYES**
Hold the eyelids apart and flush the eye gently with a large amount of water for at least 15 minutes or until irritation subsides. If irritation persists get medical attention.

**SKIN**
Remove contaminated clothing and shoes. Rinse skin well with plenty of soap and water for 15-20 minutes. If irritation persists get medical attention. Wash clothing and thoroughly clean shoes before reuse.

**INGESTION**
Seek medical attention immediately. Have person sip a glass of water if able to swallow. **Do not induce vomiting unless told to do so by a poison control center or doctor.** Do not give anything by mouth to an unconscious person.

**INHALATION**
Remove person from exposure to fresh air. If person is not breathing, call 911 or an ambulance, and then give artificial respiration (CPR). If individual is breathing, but with difficulty, get immediate medical attention.

**NOTES TO PHYSICIAN**
Aluminum soluble salts may cause gastroenteritis if ingested. Treatment includes the use of demulcents. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

Note: Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

See Section 11 for Toxicological Information.
SECTION 5: FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT
None

AUTO IGNITION TEMPERATURE
Not Flammable

FLAMMABLE LIMITS IN AIR (% BY VOLUME)
LEL: Not Flammable UEL: Not Flammable

EXTINGUISHING MEDIA
Dry chemical, carbon dioxide or water mist as appropriate for surrounding material.

HAZARDOUS COMBUSTION PRODUCTS
Oxides of aluminum and carbon. Thermal decomposition may release toxic and/or hazardous gases such as hydrogen chloride gas.

FIRE FIGHTING INSTRUCTIONS
Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in a fire. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Move container from fire area if it can be done without risk. Use water spray to cool closed containers and protect fire-fighters. Do not release runoff from fire control methods to sewers or waterways. Dike area to prevent runoff and water source contamination.

SECTION 6: ACCIDENTAL RELEASE MEASURES

WATER SPILL
Prevent additional discharge of material, if possible to do so without hazard. This material is water soluble/dispersible and may not be recoverable.

LAND SPILL
Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, advise authorities.

GENERAL PROCEDURES
No smoking in spill areas. Isolate spill area and deny entry to unnecessary or unprotected personnel. Remove all sources of ignition, such as flames, hot glowing surfaces or electric arcs. Stop source of spill as soon as possible and notify appropriate personnel. Cleanup personnel must wear proper protective equipment (refer to Section 8). Decontaminate all clothing. Notify all downstream water users of possible contamination.

Create a dike or trench to contain all liquid material. Spill materials may be absorbed using clay, soil or nonflammable commercial absorbents. Treat as any dilute acid. Aluminum Chlorohydrate can be carefully neutralized with Soda Ash or Lime.

Do not place spill materials back in their original container. Containerize and label all spill materials properly.

RELEASE NOTES
Notify the National Response Center (800/424/8802) of uncontained releases to the environment in excess of the Reportable Quantity (RQ). See Section 15, Regulatory Information. Recycle or dispose of recovered material in accordance with all federal, state, and local, regulations.

For all transportation accidents, call CHEMTREC at 800/424-9300.
SECTION 7: HANDLING AND STORAGE

HANDLING
Do not get in eyes, or on skin, or clothing. Do not taste or swallow. Avoid breathing mists or fumes. Do not handle with bare hands. When preparing the working solution ensure there is adequate ventilation.

Carefully monitor handling, use and storage to avoid spills and leaks. Follow protective controls set forth in Section 8 when handling this product. Do not eat, drink, or smoke in work area. Wash hands prior to eating, drinking, or using restroom.

STORAGE

STORAGE CONDITIONS
Store in closed, properly labeled tanks or containers. Do not remove or deface labels or tags. Store in a cool, well ventilated place away from incompatible materials and sources of ignition. Keep drums upright. DO NOT reuse empty containers without commercial cleaning or reconditioning. Dry rubber-lined, plastic (HDPE) and FRP are all suitable storage materials for this product. Do not store in steel, mild stainless steel, aluminum, nickel, copper or brass containers. Product should be used within one year.

STORAGE TEMPERATURE
0°C (32°F) minimum to 30°C (86°F) maximum. Do not allow product to freeze. Freezing will affect the physical condition and may damage the material.

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT
Oxidizing agents, reducing agents, metals and magnesium (evolves hydrogen gas).

SECTION 8: EXPOSURE CONTROLS PERSONAL PROTECTION

ENGINEERING CONTROLS

VENTILATION
Local exhaust ventilation is recommended if vapors, mists or aerosols are generated. Otherwise, use general exhaust ventilation.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE AND FACE PROTECTION
Wear chemical goggles. A face shield should be worn in addition to goggles where splashing or spraying is possible.

SKIN PROTECTION
Wear chemical resistant clothing. Neoprene gloves, boots and apron or slicker suit.

RESPIRATORY PROTECTION
Not likely an inhalation hazard unless hydrogen chloride mist forms. If airborne exposures exceed the PEL, use a NIOSH/ MSHA approved negative pressure air-purifying respirator in accordance with OSHA Respiratory Protection Requirements under 29 CFR 1910.134.
GENERAL
Safety shower and eye wash station must be provided in the immediate work area. Protective equipment and clothing should be selected, used, and maintained according to applicable standards and regulations. For further information, contact the clothing or equipment manufacturer.

EXPOSURE GUIDELINES
Component Data Polyaluminum Chloride (1327-41-9): OSHA PEL: 2.0 mg/m$^3$ soluble salts as Al
ACGIH TLV: 2.0 mg/m$^3$ soluble salts as Al

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
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<tr>
<th>PROPERTY</th>
<th>VALUE</th>
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<tbody>
<tr>
<td>CHEMICAL FORMULA</td>
<td>Al$_n$(OH)$<em>m$Cl$</em>{3n-m}$</td>
</tr>
<tr>
<td>MOLECULAR WEIGHT</td>
<td>N/A</td>
</tr>
<tr>
<td>APPEARANCE</td>
<td>Clear to slightly hazy, colorless to amber liquid</td>
</tr>
<tr>
<td>ODOR</td>
<td>Odorless</td>
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<tr>
<td>pH</td>
<td>2.5 – 4.6</td>
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<tr>
<td>VAPOR PRESSURE</td>
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<td>VOLATILES, % BY VOLUME</td>
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<tr>
<td>BOILING POINT</td>
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<td>FREEZING POINT</td>
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<tr>
<td>SOLUBILITY IN WATER</td>
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<tr>
<td>SPECIFIC GRAVITY</td>
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<tr>
<td>DENSITY</td>
<td>11.15 lb/gallon @ 25°C (77°F)</td>
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<tr>
<td>VISCOSITY</td>
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</table>

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY
Stable under normal temperatures and pressure.

CONDITIONS TO AVOID
High temperature decomposition. Avoid contact with alkalies and metals.

INCOMPATIBILITY WITH OTHER MATERIALS
Bases (alkaline materials).

HAZARDOUS DECOMPOSITION PRODUCTS
Thermal decomposition may release toxic and/or hazardous gases such as hydrogen chloride gas.

HAZARDOUS POLYMERIZATION
Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

ANIMAL TOXICOLOGY

EYES
No available data for product.
SKIN
No available data for product.


ACUTE ORAL EFFECTS
No available data for product.

ACUTE INHALATION EFFECTS
No available data for product.

EFFECTS FOLLOWING PROLONGED OR REPEATED EXPOSURE
No available data for product.

CARCINOGENICITY
This product (or any component at a concentration of 0.1% or greater) is not listed by NTP, IARC, OSHA, EPA, or any other authority as a carcinogen.

MUTAGENICITY
No available data.

REPRODUCTIVE/DEVELOPMENTAL TOXICITY
No available data for product.

Component Data Aluminum Chlorohydrate (12042-91-0): Oral Rat TDLo 13g/kg (7-19 day(s) pregnant female continuous).

SECTION 12: ECOLOGICAL INFORMATION

GENERAL COMMENT
No available data for product.

Component Data Aluminum Chlorohydrate (12042-91-0): Fish 1000 ug/l 24 week(s) (mortality) coho salmon, silver salmon (oncorhynchus kisutch). Persistence and degradation, no data available.

ENVIRONMENTAL FATE
No available data for product.

SECTION 13: DISPOSAL CONSIDERATIONS

All disposals of this material must be done in accordance with Federal, state and local regulations. Waste characterization and compliance with disposal regulations are the responsibilities of the waste generator.

SPILL RESIDUES
Clean-up material may be a RCRA Hazardous waste on disposal if the pH is <2. Test waste for corrosivity, D002, prior to disposal.

EMPTY CONTAINERS
“Empty” containers retain product residue (liquid and/ or vapor). Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.
SECTION 14: TRANSPORT INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.01 BY THE U.S DEPARTMENT OF TRANSPORTATION.

SECTION 15: REGULATORY INFORMATION

U.S FEDERAL REGULATIONS

CERCLA REPORTABLE QUANTITY (RQ)
Not Applicable.

TSCA (TOXIC SUBSTANCES CONTROL ACT)
All components of this product are listed on the TSCA Inventory or are exempt from TSCA Inventory requirements.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) TITLE III

SARA SECTION 302 (EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 302.4):
Not Applicable.

SARA SECTION 311/312 HAZARD CATEGORIES (40 CFR 370.2):
- Fire Hazard: No
- Reactivity Hazard: No
- Release of Pressure: No
- Acute Health Hazard: Yes
- Chronic Health Hazard: No

SARA SECTION 313 (40 CFR 372.65):
Components identified with an asterisk (*) in Section 2 are subject to the reporting requirements of Section 313 of Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372.

INTERNATIONAL REGULATIONS

CANADA

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA)
This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

SECTION 16: OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA CODES</th>
<th>HMIS CODES</th>
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<tbody>
<tr>
<td>HEALTH</td>
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<tr>
<td>FLAMMABILITY</td>
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<tr>
<td>INSTABILITY</td>
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<td>PROTECTION</td>
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</tbody>
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RATING NOTES
Hazardous Materials Identification: 4 = Severe, 3 = Serious, 2 = Moderate, 1 = Slight, 0 = Minimal.
MATERIAL SAFETY DATA SHEET – Aluminum Chlorohydrate

Emergency Information:  
Business Hours: 713-658-9000  
After Hours: CHEMTREC: 800-424-9300

For Any Other Information Contact:  
ALTIVIA, Technical Marketing, 1100 Louisiana, Suite 4800, Houston, TX 77002.
Phone: 713-658-9000  
8 AM – 5 PM CST, Monday through Friday

Revisions
04/17/2012: Revised product specifications.
05/22/2012: Update of Address.
01/21/2014: Update of Name & Contact Numbers. This MSDS replaces all previous MSDS for this product.

Disclaimer of Warranty:
The information provided in this Material Safety Data Sheet has been obtained from sources believed to be reliable. ALTIVIA provides no warranties; either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein. This information is offered for your information, consideration, and investigation. You should satisfy yourself that you have all current data relevant to your particular use. ALTIVIA knows of no medical condition, other than those noted on this material safety data sheet, which are generally recognized as being aggravated by exposure to this product.