MATERIAL SAFETY DATA SHEET

Chemical Product

Product Name: AMMONIUM CHLORIDE

CAS#: 12125-02-9

C.I. No.: Not applicable.

Synonym: Ammonium Chloratum; Ammonium Chloridum; Ammonium Muriate; Sal Ammonia; Salmiac

Chemical Name: Ammonium Chloride

Chemical Formula: NH4Cl

Composition and Information on Ingredients

Name	S.K.U	% by Weight
{+--} Ammonium Chloride	GCS-4153	100

Hazards Identification

Potential Acute Health Effects: Hazardous in case of eye contact (irritant). Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion, of inhalation.

Potential Chronic Health Effects: CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

First Aid Measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention

Skin Contact: In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an antibacterial cream. Seek medical attention.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.
Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder.

LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Handling and Storage

Precautions: Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Exposure Controls/Personal Protection

Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill: Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits: TWA: 10 STEL: 20 (mg/m3) from ACGIH (TLV) [United States] Inhalation TWA: 10 STEL: 20 (mg/m3) [United Kingdom (UK)] Inhalation TWA: 10 STEL: 20 (mg/m3) from NIOSH [United States] Inhalation TWA: 10 STEL: 20 (mg/m3) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Physical and Chemical Properties

Physical state and appearance: Solid. (Solid crystalline powder.)

Odor	: Odorless. (Slight.)
Taste	: Cooling, Saline.
Molecular Weight	: 53.49 g/mole
Color	: White
pH (1% soln/water)	: 5.5 [Acidic.]
Boiling Point	: 520°C (968°F)
Melting Point	: Decomposition temperature: 338°C (640.4°F)
Flash Point	: Not available.
Critical Temperature	: Not available.
Specific Gravity	: 1.53 (Water = 1)
Vapor Pressure	: Not applicable
Vapor Density	: Not available.
Volatility	: Not available.
Odor Threshold	: Not available.
Water/Oil Dist. Coeff.	: Not available
Ionicity (in Water)	: Not available.
Dispersion Properties	: See solubility in water, methanol.

Solubility : Soluble in cold water, hot water, and methanol. Insoluble in diethyl ether, acetone. Almost insoluble in ethyl acetate. Very slightly soluble in Ethanol; Solubility in Ethanol: 0.6 g/100 ml water at 19 deg. C. Solubility in Water: 29.7 g/100ml water at O deg. C 75.8 g/100 ml water at 100 deg. C 37.8 lbs./100 lbs. water at 70 deg. F 28.3% (w/w) in water at 25 deg. C Soluble in liquid ammonia.

Stability and Reactivity Data

Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Incompatible materials
Incompatibility with various substances: Reactive with acids, alkalis.
Corrosivity: Non-corrosive in presence of glass.
Special Remarks on Reactivity: Forms gels on prolonged contact with water; absorbs acids, carbon dioxide. When exposed to heat aluminum trihydroxide composes forming aluminum oxide and water vapor beginning at 300 C (572 F). Aluminum trihydroxide reacts vigorously with strong acids, and will dissolve in caustic solutions.
Special Remarks on Corrosively: Not available.
Polymerization: Will not occur.

Toxicological Information

Routes of Entry: Inhalation. Ingestion.
Toxicity to Animals: LD50: Not available. LC50: Not available.
Chronic Effects on Humans: Causes damage to the following organs: lungs, mucous membranes.
Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: Not available.
Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects:
Skin: Causes skin irritation with redness, itching and pain. Eyes: Causes eye irritation with redness, itching and pain.
Inhalation: Causes respiratory tract irritation. Symptoms may include coughing, and shortness of breath. May cause systemic effects similar to those for ingestion. Ingestion: Ingestion of large doses of nitrates causes gastrointestinal tract irritation with nausea, vomiting, abdominal cramps, diarrhea (possibly bloody, from gastrointestinal hemorrhage). Under some circumstances, when the nitrate is converted by bacteria in the stomach to nitrite, it may also cause methemoglobinemia, cyanosis (a bluish discoloration of the skin due to deficient oxygenation of the blood), convulsions and death. Methemoglobinemia is characterized by dizziness, weakness, fatigue, convulsions (seizures), drowsiness, and headache, shortness of breath, cyanosis, rapid heart rate (tachycardia) or slow heart rate (bradycardia), hypotension, chocolate brown colored blood, unconciousness.

Toxicological Data on Ingredients: Ammonium chloride: ORAL (LD50): Acute: 1650 mg/kg [Rat.]. 1300mg/kg [Mouse].

Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Disposal Considerations

Waste Disposal: Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Transformation Information

Land transport (ADR-RID)

General information : Not regulated.

Sea transport (IMDG) [English only]

General information : Not regulated.

Air transport (ICAO-IATA) [English only]

General information : Not regulated

Other Regulatory Information

Federal and State Regulations: Illinois toxic substances disclosure to employee act: Ammonium chloride Illinois chemical safety act: Ammonium chloride New York release reporting list: Ammonium chloride Rhode Island RTK hazardous substances: Ammonium chloride Pennsylvania RTK: Ammonium chloride Minnesota: Ammonium chloride Massachusetts RTK: Ammonium chloride Massachusetts spill list: Ammonium chloride New Jersey: Ammonium chloride New Jersey spill list: Ammonium chloride Louisiana spill reporting: Ammonium chloride California Director's List of Hazardous Substances: Ammonium chloride TSCA 8(b) inventory: Ammonium chloride CERCLA: Hazardous Substances. Ammonium chloride: 5000 lbs. (2268 kg) Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

Additional Information

References: Not available.

Other Special Considerations: Not available.

Disclaimer:

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