Safety Data Sheet (MSDS)

(According to GB/T 16483 and GB/T 17519; Adapts to GHS, IMDG, IATA Standards)

Ammonium Bicarbonate (Food Grade)

SECTION 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifiers

- Product Name: Ammonium Bicarbonate (Food Grade)
- Product Number: ABC-20260228
- Brand: SIGALD
- CAS-No.: 1066-33-7
- Synonyms: Ammonium hydrogen carbonate; Food Grade Bicarbonate of ammonia; 碳酸氢铵（食品级）
- EC-No.: 213-911-5

1.2 Details of the supplier of the safety data sheet

- Company: NEWAY SINOPHC TECH. LIMITED
- RM. 204, BUILDING 3, NO. 188, AONA RD., CHINA (SHANGHAI) PILOT FREE TRADE ZONE.
- Telephone: +86-021-50350029
- Fax: +86-021-50350029

1.3 Emergency telephone

Emergency Phone #: +86-021-50350029 (CHEMTREC)

1.4 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

- Identified Uses: Food additive (leavening agent for bakery, pastry, biscuit); acidity regulator; feed additive; industrial foaming agent (non-food grade).
- Uses Advised Against: Not for pharmaceutical injection; avoid contact with strong acids and high temperature in closed space.

SECTION 2: Hazards Identification

Summary of Emergency Measures	**White crystalline powder. Slightly hazardous (irritant). After inhalation: Move to fresh air, keep respiratory tract unobstructed. In case of skin contact: Rinse skin with plenty of running water for 10-15 minutes. After eye contact: Rinse with plenty of water for 15 minutes, consult a doctor if irritation persists. After swallowing: Drink plenty of water, do not induce vomiting, consult a doctor immediately. Non-combustible, decomposes at high temperature to release ammonia gas.**

2.1 GHS Classification

- Skin irritation (Category 2)
- Eye irritation (Category 2)
- Specific target organ toxicity - single exposure (Respiratory tract, Category 3)

2.2 GHS Label Elements

- Hazard Pictogram: (Exclamation mark)

- Signal Word: **Warning**
- Hazard Statements:
  - H315: Causes skin irritation
  - H319: Causes serious eye irritation
  - H335: May cause respiratory irritation
- Precautionary Statements:
  - P261: Avoid breathing dust/fume/gas/mist/vapours/spray
  - P264: Wash skin thoroughly after handling
  - P280: Wear protective gloves/eye protection/face protection
  - P302+P352: If on skin: Wash with plenty of water
  - 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/doctor if you feel unwell
  - P332+P313: If skin irritation occurs: Get medical advice/attention
  - P337+P313: If eye irritation persists: Get medical advice/attention
  - P362: Take off contaminated clothing and wash before reuse

2.3 Physical and Chemical Hazards

Decomposes at ≥60℃ to release ammonia (NH_3) and carbon dioxide (CO_2) gas; no combustion, no explosion risk; reacts with strong acids to release CO_2 gas violently.

2.4 Health Hazards

- Inhalation of dust/ammonia gas may cause respiratory tract irritation, cough, sore throat.
- Direct contact with skin causes mild irritation, redness and dryness.
- Direct contact with eyes causes serious irritation, redness and tearing.
- Accidental ingestion may cause nausea, abdominal discomfort and vomiting; no acute toxicity at food dosage.

2.5 Environmental Hazards

- Ammonia gas released by decomposition may cause slight alkalization of water/soil in high concentration; no bioaccumulation potential.
- Biodegradable; no long-term adverse effects on aquatic/terrestrial organisms at normal use concentration.

2.6 Other Hazards

No additional hazards identified.

SECTION 3: Composition/Information on Ingredients

- Substance / Mixture: Pure substance (100%)

3.1 Main Components

Formula	NH_4HCO_3
Molecular Weight	79.06 g/mol
CAS-No.:	1066-33-7
EC-No.:	213-911-5
Concentration (w/w)	≥99.2% (Food Grade)

Hazardous Ingredients

Component	Classification	Concentration (w/w)
Ammonium Bicarbonate	Skin/Eye Irritant, Respiratory Irritant	99.2-99.8%
Total Hazardous Ingredients	**100%**	**99.2-99.8%**

SECTION 4: First Aid Measures

4.1 Description of First-Aid Measures

- If Inhaled: Move victim to fresh air and rest in a position comfortable for breathing. Loosen tight clothing. If breathing is difficult, give oxygen. Call a doctor if symptoms persist.
- In Case of Skin Contact: Immediately rinse skin with plenty of running water for 10-15 minutes. Remove all contaminated clothing and shoes. Wash clothing before reuse. If irritation occurs, seek medical advice.
- In Case of Eye Contact: Immediately hold eyes open and rinse thoroughly with plenty of running water for at least 15 minutes. Remove contact lenses if present and easy to do. Do not rub eyes. Call a doctor immediately if irritation, pain or blurred vision occurs.
- If Swallowed: Rinse mouth with water. Drink plenty of water (200-300 mL) to dilute. Do not induce vomiting. Call a doctor or poison control center immediately, even if no symptoms appear.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

- Acute Effects: Respiratory tract irritation, skin redness, eye irritation, gastrointestinal discomfort after ingestion.
- Delayed Effects: No known delayed toxic effects based on current data and long-term use.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

No specific antidote; treat symptomatically according to clinical manifestations.

4.4 Notes to Physician

Inform the physician of the product composition and symptoms of exposure; supportive treatment is recommended.

SECTION 5: Firefighting Measures

5.1 Extinguishing Media

- Suitable Extinguishing Media: Water spray, carbon dioxide (CO_2), dry powder, foam.
- Unsuitable Extinguishing Media: No limitations of extinguishing agents.

5.2 Special Hazards Arising from the Substance or Mixture

- Non-combustible; decomposes at high temperature (≥60℃) to release ammonia gas (pungent odor) and carbon dioxide gas; ammonia gas is slightly toxic and irritating, may cause discomfort to firefighters.
- No hazardous combustion products; no secondary fire/explosion hazard.

5.3 Advice for Firefighters

- Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective gear to avoid inhalation of ammonia gas and dust.
- Keep a safe distance; cool containers with water spray to prevent decomposition.
- Ensure good ventilation at fire scene to disperse ammonia gas.

SECTION 6: Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Wear FFP2 dust mask, chemical protective goggles, nitrile rubber gloves and protective clothing to avoid contact with dust and inhalation.
- Evacuate non-essential personnel from the spill area; ensure good ventilation to disperse ammonia gas (if decomposed).
- Do not touch or walk through the spilled material.

6.2 Environmental Precautions

- Prevent spilled material from entering sewers, rivers, lakes and other water bodies to avoid slight alkalization of water.
- If spilled into water/soil, dilute with plenty of water and neutralize with a small amount of dilute acid if necessary.

6.3 Methods and Materials for Containment and Cleaning Up

- Small Spill: Gently sweep up with a clean dry brush, collect in a sealed plastic container for reuse or disposal; do not use water to avoid dissolution and ammonia release.
- Large Spill: Contain with plastic barriers to prevent spread; transfer to a sealed HDPE drum with a clean shovel for disposal; clean the spill area with a small amount of water and ventilate thoroughly.

6.4 Reference to Other Sections

For disposal, see Section 13.

SECTION 7: Handling and Storage

7.1 Precautions for Safe Handling

- Operate in a well-ventilated, dry area with local exhaust ventilation; avoid generating dust during handling, mixing and packaging.
- Wear personal protective equipment (PPE) as specified in Section 8; wash hands and face thoroughly after handling, do not eat, drink or smoke in the workplace.
- Avoid contact with strong acids (HCl, H_2SO_4), strong alkalis and high temperature (≥60℃); do not mix with acidic food additives in closed containers.

- Use non-sparking tools and equipment; avoid friction and impact to prevent dust accumulation.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

- **Storage Conditions**: Store in a cool, dry, well-ventilated food-grade warehouse. Keep container tightly sealed to prevent moisture absorption and caking, and avoid decomposition. Storage temperature **≤25℃**, relative humidity **≤60%**.
- **Incompatibilities**: Strong acids (pH < 2), strong oxidants, moisture, high temperature; do not store with acidic food additives (citric acid, malic acid), metal salts.
- **Storage Class (TRGS 510)**: 13 (Non-Hazardous Solids, with irritant properties)
- **Shelf Life**: 24 months (unopened, under specified storage conditions); 6 months after opening (re-seal tightly and use as soon as possible).
- **Packaging Requirements**: Store in moisture-proof sealed HDPE drums or paper bags with plastic inner lining.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

表格

Component	CAS-No.	TLV-TWA (8h)	TLV-STEL (15min)	Basis
Ammonium Bicarbonate	1066-33-7	10 mg/m³ (dust)	20 mg/m³ (dust)	ACGIH
Ammonia (decomposition product)	7664-41-7	25 ppm	35 ppm	ACGIH

8.2 Exposure Controls

- **Engineering Controls**: Install local exhaust ventilation at the operation station to capture dust and ammonia gas; maintain general ventilation in the workplace; use moisture-proof equipment to avoid product caking.
- **Personal Protective Equipment (PPE)**:
  - Eye/Face Protection: Chemical protective goggles with side shields; face shield recommended for large-scale handling.
  - Skin Protection: Nitrile rubber gloves (thickness ≥0.11mm), chemical protective clothing, anti-slip safety shoes.
  - Respiratory Protection: FFP2 dust mask for normal handling; self-contained breathing apparatus (SCBA) for high concentration dust/ammonia gas exposure.
  - Hand Protection: Replace gloves if damaged or contaminated; wash gloves before removal.
- **Control of Environmental Exposure**: Do not discharge waste material into the environment directly; treat according to local regulations.

SECTION 9: Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

a) Physical State: Solid (crystalline powder/granular)b) Color: Whitec) Odor: Slight ammonia odor (trace decomposition)d) Melting Point/Freezing Point: Decomposes at ≥60℃ (no melting)e) Initial Boiling Point and Boiling Range: N/A (decomposes before boiling)f)

Flammability (Liquid/Gas): Non-combustible (solid)g) Upper/Lower Flammability or Explosive Limits: Not applicableh) Flash Point: Not applicablei) Autoignition Temperature: Not applicablej) Decomposition Temperature: ≥60℃ (decomposes to NH_3, CO_2 and H_2O)k) pH Value (25℃): 7.0-8.5 (10% aqueous solution)l) Viscosity (25℃): Not applicable (solid)m) Water Solubility: 21.6 g/100mL (20℃); solubility increases with temperature (decomposes at high temperature)n) Partition Coefficient (n-octanol/water): < -2.0 (highly hydrophilic)o) Vapor Pressure (25℃): Negligible (<0.01 hPa); increases with temperaturep) Density (25℃, solid): 1.586 g/cm³q) Bulk Density: 0.8-1.0 g/cm³r) Particle Characteristics: 80-120 mesh crystalline powders) Explosive Properties: Not explosivet) Oxidizing Properties: None (no oxidizing/reducing properties)

9.2 Other Safety Information

Hygroscopic; easy to absorb moisture and cake in humid environment; decomposes rapidly in hot water to release ammonia gas.

SECTION 10: Stability and Reactivity

10.1 Chemical Stability

Stable under recommended storage conditions (≤25℃, dry, sealed); no spontaneous reaction with air and water at room temperature.

10.2 Possibility of Hazardous Reactions

- Reacts **violently** with strong acids to release a large amount of carbon dioxide gas, may cause splashing of the solution.
- Decomposes at ≥60℃ to release ammonia and carbon dioxide gas, pressure increases in closed containers.
- No polymerization reaction occurs under any conditions.

10.3 Conditions to Avoid

High temperature (≥60℃), moisture/humidity, strong acids, strong oxidants, direct sunlight, friction/impact (dust).

10.4 Incompatible Materials

- Strong acids: Hydrochloric acid, sulfuric acid, nitric acid, citric acid (food grade).
- Strong oxidants: Potassium permanganate, hydrogen peroxide.
- Moisture and water (large amount).
- Metal salts: Copper sulfate, ferric chloride.

10.5 Hazardous Decomposition Products

Ammonia (NH_3), carbon dioxide (CO_2), water (H_2O); no toxic decomposition products.

SECTION 11: Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity**:
  - Oral (Rat, LD_{50}): 2450 mg/kg (mild toxicity)
  - Dermal (Rabbit, LD_{50}): >5000 mg/kg (practically non-toxic)
  - Inhalation (Rat, LC_{50}): >1000 mg/m³ (4-hour exposure, dust)

- **Skin Corrosion/Irritation**: Mild irritation (Rabbit test, 4-hour exposure); redness, no corrosion.
- **Serious Eye Damage/Eye Irritation**: Moderate to serious irritation (Rabbit test, 24-hour exposure); redness, tearing, reversible after rinsing.
- **Respiratory or Skin Sensitization**: No skin/respiratory sensitization (long-term human/animal use data).
- **Germ Cell Mutagenicity**: No mutagenic effects (Ames test, chromosome aberration test); negative results.
- **Carcinogenicity**: Not classified as carcinogenic by IARC, EPA, or NTP; FDA/CFDA GRAS certified (food grade).
- **Reproductive Toxicity**: No adverse reproductive/developmental effects in animal tests at low concentration; safe for food use.
- **Specific Target Organ Toxicity (Single/Repeated Exposure)**: Respiratory tract irritation (single high concentration exposure); no target organ toxicity at food dosage.
- **Aspiration Hazard**: Low (crystalline powder, no aspiration risk for normal handling).

11.2 Additional Information

Food-grade ammonium bicarbonate is approved for food use by FAO/WHO, with no ADI limit (acceptable daily intake); safe for human consumption at normal leavening dosage.

SECTION 12: Ecological Information

12.1 Toxicity

- Fish (Zebrafish, LC_{50}): >1000 mg/L (96-hour exposure, aqueous solution)
- Daphnia (EC_{50}): >500 mg/L (48-hour exposure, aqueous solution)
- Algae (EC_{50}): >800 mg/L (72-hour exposure, aqueous solution)Ammonia gas released in high concentration may cause slight toxicity to aquatic organisms; no toxicity at normal use concentration.

12.2 Persistence and Degradability

- Fully biodegradable in water/soil; decomposes into ammonia, carbon dioxide and water, which are natural substances in the environment.
- No persistent organic pollutants (POPs); degradation half-life <7 days in water.

12.3 Bioaccumulative Potential

No bioaccumulation potential; the product is water-soluble and decomposes into small molecules, which cannot be accumulated in the body of organisms.

12.4 Mobility in Soil

High mobility in soil (water-soluble); easy to leach into groundwater in large amount, may cause slight alkalization of groundwater (pH increase).

12.5 Results of PBT and vPvB Assessment

Not classified as PBT/vPvB (no persistence, no bioaccumulation, low toxicity); environmentally friendly at normal use concentration.

12.6 Other Adverse Effects

Ammonia gas released in high concentration may cause slight stress to terrestrial plants (leaf yellowing); no long-term adverse effects on the ecosystem.

SECTION 13: Disposal Considerations

13.1 Waste Treatment Methods

- **Product Waste**: Uncontaminated waste can be fully reused as food/industrial raw material; contaminated waste can be neutralized with a small amount of dilute acid (citric acid) to decompose, then discharged after dilution with water; or disposed of by licensed solid waste treatment facilities.
- **Packaging Waste**: Rinse packaging thoroughly with water (neutralize if necessary), then dispose of as non-hazardous waste or recycle (HDPE/paper).
- **Waste Water**: Waste water containing ammonium bicarbonate can be discharged after biological treatment (sewage treatment plant), no special treatment required.

13.2 Disposal Notes

- Do not dispose of waste material into sewers, rivers or soil in large amount; avoid environmental alkalization.
- Do not mix with acidic waste during disposal to prevent violent reaction and gas release.
- Comply with local, national and international waste disposal regulations (e.g., China GB 8978, EU WFD).

SECTION 14: Transport Information

14.1 UN Number

ADR/RID: 9199; IMDG: 9199; IATA-DGR: 9199

14.2 UN Proper Shipping Name

ADR/RID: Ammonium bicarbonate, solid; IMDG: Ammonium bicarbonate, solid; IATA-DGR: Ammonium bicarbonate, solid

14.3 Transport Hazard Class(es)

ADR/RID: 9 (Miscellaneous dangerous goods); IMDG: 9 (Miscellaneous dangerous goods); IATA -DGR: 9 (Miscellaneous dangerous goods)

14.4 Packaging Group

ADR/RID: III (Minor danger); IMDG: III (Minor danger); IATA-DGR: III (Minor danger)

14.5 Environmental Hazards

ADR/RID: No; IMDG Marine Pollutant: No; IATA-DGR: No

14.6 Special Precautions for User

- Transport at **≤25℃**; use moisture-proof, sealed packaging (HDPE drum/paper bag with plastic inner lining); avoid rain, moisture, direct sunlight and high temperature during transport.
- Do not stack heavy objects on the packaging to prevent caking; avoid collision and friction to prevent dust generation.
- Do not transport with strong acids, strong oxidants, acidic food additives and water-containing goods (separate loading and unloading).

- Ensure good ventilation in the transport vehicle; no smoking in the vehicle.

14.7 Incompatible Materials

Avoid transport with strong acids, strong oxidants, moisture, acidic food additives, metal salts.

Further Information: Classified as Class 9 miscellaneous dangerous goods for transport; comply with international transport regulations (ADR/RID, IMDG Code, IATA-DGR).

SECTION 15: Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- **National Regulations (China)**:
  - Hazardous Chemical Safety Management Regulation (Class 9 miscellaneous dangerous goods)
  - National Food Safety Standard for Food Additives (GB 2760-2021) – approved as leavening agent/acidity regulator (no dosage limit for food use)
  - National Food Safety Standard for Ammonium Bicarbonate (GB 1888-2021) – strict quality requirements for food grade
  - Water Pollution Prevention and Control Law, Air Pollution Prevention and Control Law
- **International Regulations**:
  - GHS Classification (Rev. 9): Skin Irrit. 2, Eye Irrit. 2, STOT-single 3 (Resp. tract)
  - REACH (EU): Registered; not in SVHC Candidate List; complies with EC 1333/2008 (food grade)
  - TSCA (US): Listed on the TSCA Inventory; FDA GRAS certified (21 CFR 184.1135)
  - Codex Alimentarius (FAO/WHO): Approved as food leavening agent (no ADI limit)
  - IMDG Code/IATA-DGR/ADR/RID: Class 9 miscellaneous dangerous goods, PG III

15.2 Other Regulations

Comply with local food safety, occupational health and environmental protection regulations; the workplace must meet the occupational exposure limit (OEL) of dust/ammonia gas.

SECTION 16: Other Information

- **Further Information**: This MSDS is based on current scientific knowledge and complies with GB/T 16483, GB/T 17519, and GHS standards. It is intended for safe handling, storage, transport, and disposal of food-grade Ammonium Bicarbonate. The supplier is not liable for damage caused by improper use, storage or non-compliance with safety precautions.
- **Revision Date**: 28 FEB 2026
- **Version**: V1.0