

**Voluntary Report** – Voluntary - Public Distribution

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**Report Name:** Draft National Food Safety Standard Food Additive Ammonium Carbonate Notified to WTO

**Country:** China - People's Republic of

**Post:** Beijing

**Report Category:** FAIRS Subject Report, Sanitary/Phytosanitary/Food Safety, WTO Notifications, Trade Policy Monitoring

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**Report Highlights:**

On July 11, 2024, China notified the draft National Food Safety Standard Food Additive Ammonium Carbonate to the World Trade Organization (WTO) under G/SPS/N/CHN/1308. China's SPS Enquiry Point at [sps@customs.gov.cn](mailto:sps@customs.gov.cn) will accept comments until September 9, 2024. This report Provides an unofficial translation of the draft standard. Stakeholders should conduct their own review of the standard and provide comments as necessary.

**Report Summary:**

On July 11, 2024, China notified the draft National Food Safety Standard Food Additive Ammonium Carbonate to the World Trade Organization (WTO) under [G/SPS/N/CHN/1308](#). China's SPS Enquiry Point at [sps@customs.gov.cn](mailto:sps@customs.gov.cn) will accept comments until September 9, 2024.

This standard is applicable to the food additive ammonium carbonate, which is prepared from ammonia, carbon dioxide and water by absorption, crystallization, separation, drying and cooling, consists of ammonium carbamate, ammonium carbonate and ammonium hydrogen carbonate in varying proportions. It specifies the technical requirements and testing methods for food additive ammonium carbonate.

This report provides an unofficial translation of the draft notified standard. Stakeholders should conduct their own review of [the standard](#).

## BEGIN TRANSLATION

### National Food Safety Standard

#### Food Additive Ammonium carbonate

##### 1. Scope of Application

This standard applies to ammonium carbonate, a food additive made from ammonia, carbon dioxide, and water through process such as absorption, crystallization, separation, drying, and cooling. It is composed of different proportions of ammonium carbamate, ammonium carbonate, and ammonium bicarbonate.

##### 2 Chemical name, molecular formula, structural formula and relative molecular mass

###### 2.1 Chemical name

Ammonium carbamate, ammonium carbonate, ammonium bicarbonate

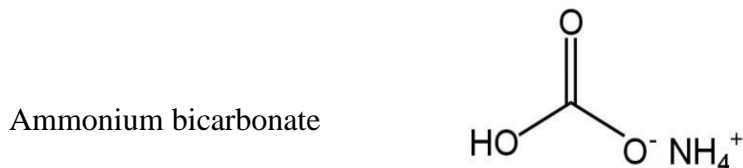
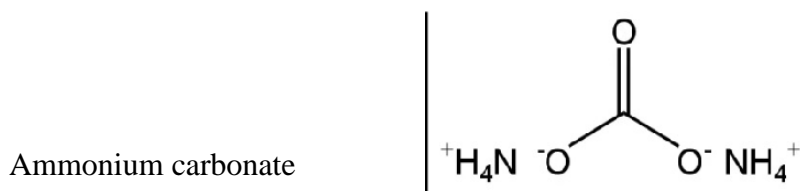
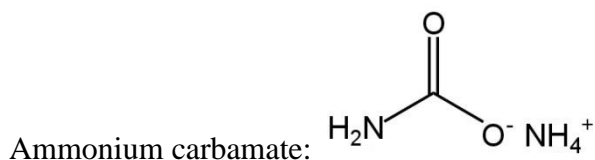
###### 2.2 Molecular formula

Ammonium carbamate:  $\text{H}_2\text{NCO}_2\text{NH}_4$

Ammonium carbonate:  $(\text{NH}_4)_2\text{CO}_3$

Ammonium bicarbonate:  $\text{NH}_4\text{HCO}_3$

###### 2.3 Structural formula



###### 2.4 Relative molecular mass

Ammonium carbamate: 78.071 (based on 2022 international relative atomic mass)

Ammonium carbonate: 96.086 (based on 2022 international relative atomic mass)

Ammonium bicarbonate: 79.055 (based on 2022 international relative atomic mass)

### 3 Technical Requirements

#### 3.1 Sensory Requirements

Sensory requirements shall conform to the provisions in Table 1.

**Table 1: Sensory Requirements**

Items	Requirement	Testing Method
Color	White	Take an appropriate amount of sample and place it in a clean and dry white porcelain plate. Observe its color and condition under natural light. Gently fan with your hands and smell its odor.
State	Powdered or lumpy crystalline	
Odor	Stimulating ammonia odor	

#### 3.2 Physical and Chemical Indicators

Physical and chemical indicators shall conform to the provisions in Table 2.

**Table 2: Physical and Chemical Indicators**

Items	Indicators	Testing Method
Content (calculated as NH <sub>3</sub> ), w/%	30.5~34.0	A.4 in Appendix A
Ignition residue, w/% ≤	0.1	GB/T 9741 <sup>a</sup>
Chloride/(calculated as Cl <sup>-</sup> )/(mg/kg) ≤	30	A.5 in Appendix A
Sulfate (calculated as SO <sub>4</sub> <sup>2-</sup> )/(mg/kg) ≤	50	A.6 in Appendix A
Non-volatile matter /(mg/kg) ≤	100	A.7 in Appendix A
Lead (Pb)/ (mg/kg) ≤	1.0	GB 5009.12 or GB 5009.75
Total arsenic (in As)/(mg/kg) ≤	1.0	GB 5009.11 or GB 5009.76

<sup>a</sup> Process according to "4.2 Solid Sample", with a sample size of 3g.

## **Appendix A Testing Method**

### **A.1 Caution**

Some of the testing procedures specified in the testing method may lead to dangerous situations. The operator should take appropriate safety and protective measures.

### **A.2 General Provisions**

Unless otherwise specified, the reagents and water used in this standard refer to analytical grade reagents and third grade water as specified in GB/T 6682. The standard solutions, impurity determination standard solutions, preparations, and products used in the experiment shall be prepared in accordance with the provisions of GB/T 601, GB/T 602, and GB/T 603 unless otherwise specified. When the solvent used in the test is not specified, it refers to aqueous solution.

### **A.3 Identification Test**

#### **A.3.1 Reagents and Materials**

A.3.1.1 Concentrated hydrochloric acid.

A.3.1.2 Calcium hydroxide.

A.3.1.3 Hydrochloric acid solution (1+1, volume ratio): Measure 50 mL of hydrochloric acid and dilute to 100 mL with water.

A.3.1.4 Calcium hydroxide solution (3g/L): Weigh 3g of calcium hydroxide and place it in a reagent bottle. Add 1000mL of water, stopper the bottle, shake vigorously, and let it sit for 1 hour. Take the upper clear liquid when using.

A.3.1.5 Red litmus paper.

A.3.1.6 Evaporating dish.

#### **A.3.2 Instruments and Equipment**

A. 3.2.1 Heating plate or electric furnace.

A. 3.2.2 Electronic balance: sensitivity of 0.01 g.

#### **A.3.3 Identification Method**

##### **A.3.3.1 Solubility**

Weigh about 1g of the sample, precision to 0.01 g, place it in a beaker, add about 7mL of water, shake for no less than 30 s, and observe the dissolution of the sample within 5 minutes. The sample is easily

soluble in water.

### A.3.3.2 Identification of carbonates

Weigh about 10g of the sample, precision to 0.01 g, dissolve it in 10 mL of water, and add hydrochloric acid solution (A.3.1.3) to generate bubbles. When the bubbled gas is introduced into a calcium hydroxide solution (A.3.1.4), it forms a white precipitate first; continue to aerate and the solution should become clear.

### A.3.3.3 Thermal test

Weigh about 1 g of the sample, precision to 0.01 g, place it in a beaker. Heat it on a heating plate or electric furnace, and the sample will decompose when heated. The steam generated can turn wet red litmus paper blue.

## A. 4 Content Determination (Calculated as NH<sub>3</sub>)

### A.4.1 Principle

The sample is dissolved in water, and the ammonia content was determined by titration with a standard titration solution of hydrochloric acid using methyl orange as an indicator.

### A.4.2 Reagents and Materials

A.4.2.1 Standard titration solution of hydrochloric acid: c (HCl)=1 mol/L

A. 4.2.2 Methyl orange indicator solution

### A.4.3 Instruments and Equipment

Electronic balance: the reciprocal sensibility is 0.0001 g.

### A.4.4 Analysis Steps

Weigh 1.5 g to 2.0 g of the sample, precision to 0.0001 g, place it in a 250 mL conical flask. Add 100 mL of water to dissolve it completely. Add 3 drops of methyl orange indicator solution and titrate with standard titration solution of hydrochloric acid until the test solution changes from yellow to orange. Simultaneously conduct blank experiments.

### A.4.5 Calculation of Results

The mass fraction  $w_1$  of the content (calculated as NH<sub>3</sub>) is calculated according to equation (A.1):

$$w_1 = \frac{(V_1 - V_0) \times c_1 \times M}{m_1 \times 1000} \times 100\% \dots \dots \dots (A.1)$$

In which:

$v_1$ - the volume of hydrochloric acid standard titration solution consumed by the sample solution,

in milliliters (mL);

$v_0$ - the volume of hydrochloric acid standard titration solution consumed by blank solution, in milliliters (mL);

$c_1$ - concentration of hydrochloric acid standard titration solution, in moles per liter (mol/L);

$m_1$ - the mass of the sample, in grams (g);

$M$  - the molar mass of ammonia, in grams per mole (g/mol) ( $M=17.03$ );

1000- Conversion factor.

The arithmetic mean of parallel measurement results shall be taken as the measurement result, and the absolute difference between two independent measurement results obtained under repeatability conditions shall not exceed 1% of the arithmetic mean.

## **A.5 Determination of chloride (calculated as Cl<sup>-</sup>)**

### **A.5.1 Principle**

Add silver nitrate solution to an acidic medium to produce a white suspension of silver chloride with chloride ions, and compare it with a standard turbid solution.

### **A.5.2 Reagents and Materials**

A.5.2.1 Nitric acid.

A. 5.2.2 Silver nitrate

A. 5.2.3 Sodium chloride: Superior grade purity

A. 5.2.4 Sodium carbonate

A. 5.2.5 Nitric acid solution (10.5%): Measure 105 mL of nitric acid and dilute to 1000 mL with water.

A. 5.2.6 Silver nitrate solution (17 g/L): Accurately weigh 17.0 g of silver nitrate, dissolve it in water and dilute to 1000 mL

A. 5.2.7 Chloride standard solution (0.01 mg/mL): Weigh 0.165 g of sodium chloride, dissolve it in water and dilute to 100 mL to prepare a chloride standard reserve solution (1.0 mg/mL). Draw 10 mL of chloride standard reserve solution into a 1000 mL volumetric flask, and dilute to the mark with water to obtain chloride standard solution (0.01 mg/mL).

### **A.5.3 Instruments and Equipment**

A. 5.3.1 Electronic balance: with a sensitivity of 0.01 g and 0.0001 g.

A. 5.3.2 Nessler's colorimetric tube.

A. 5.3.3 Water bath pot

## **A.5.4 Analysis Steps**

### **A.5.4.1 Preparation of sample solution**

Weigh 0.5g of the sample and place it in a 50 mL beaker. Add 10 mL of distilled water to dissolve it. Add 0.005g of sodium carbonate and slowly evaporate on a steam bath until it is dry. Then dissolve the residue in 30mL of distilled water and transfer it to a 50 mL Nessler colorimetric tube as the sample solution.

### **A.5.4.2 Preparation of standard solution**

Transfer 1.50 mL of chloride standard solution and place it in a 50 mL Nessler colorimetric tube. Dilute with 25 mL of water as the standard solution.

### **A.5.4.3 Determination**

Add 10 mL of nitric acid solution and 1 mL of silver nitrate solution to the sample solution and standard solution, respectively, and dilute to 50 mL with water.

Slowly shake well and rest in the dark for 5 min. Place both on a black background and observe from above the colorimetric tube downwards to compare the resulting turbidity. The turbidity of the sample solution is not deeper than that of the standard solution, that is, the chloride content in the sample is not greater than 30 mg/kg.

## **A.6 Determination of Sulfate (calculated as $\text{SO}_4^{2-}$ )**

### **A.6.1 Principle**

Add hydrogen peroxide to the sample to convert various sulfur-containing ions into sulfate ions. In an acidic medium, barium ions and sulfate ions produce white barium sulfate suspended particles, which are then compared with a standard turbid solution.

### **A.6.2 Reagents and Materials**

A.6.2.1 Hydrogen peroxide: with a mass fraction of 30%

A.6.2.2 Hydrochloric acid solution: mass fraction of 10%

A.6.2.3 Sodium carbonate

A.6.2.4 Barium chloride

A.6.2.5 Anhydrous Sodium Sulfate: Superior Grade Pure

A.6.2.6 Barium chloride solution (100 g/L): Accurately weigh 10.0 g of barium chloride, dissolve it in



water and dilute to 100 mL.

A.6.2.7 Sulfate standard solution (0.1 mg/mL): Weigh 0.148 g of anhydrous sodium sulfate, dissolve it in water and dilute to 100 mL, and prepare a sulfate standard reserve solution (1.0 mg/mL). Draw 10 mL of sulfate standard reserve solution into a 100 mL volumetric flask, add water to the mark to obtain the sulfate standard solution (0.1 mg/mL).

### **A.6.3 Instruments and Equipment**

A.6.3.1 Electronic balance: with a sensitivity of 0.01g and 0.0001g.

A.6.3.2 Nessler's colorimetric tube

A.6.3.3 Water bath pot.

### **A.6.4 Analysis Steps**

#### **A.6.4.1 Preparation of sample solution**

Weigh 4 g of the sample and place it in a 50 mL beaker. Add 40 mL of distilled water to dissolve it. Add 0.01 g of sodium carbonate and 1 mL of 30% hydrogen peroxide, and slowly evaporate on a steam bath until dry. Then dissolve the residue with 40 mL of distilled water and transfer it to a 50 mL Nessler colorimetric tube as the sample solution.

#### **A.6.4.2 Preparation of standard solution**

Pipette 2.00 mL of sulfate standard solution, place it in a 50 mL Nessler colorimetric tube, and dilute with 20 mL water as the standard solution.

#### **A.6.4.3 Determination**

Add 2 mL of hydrochloric acid solution and 3 mL of barium chloride solution to the sample solution and standard solution, and dilute to 50mL with water respectively. Slowly shake well and rest for 10 min.

Place both on a black background and observe from above the colorimetric tube downwards to compare the resulting turbidity. The turbidity of the sample solution is not deeper than that of the standard solution, that is, the sulfate content in the sample is not greater than 50 mg/kg.

### **A.7 Determination of Non-volatile Substances**

#### **A.7.1 Principle**

The sample is placed in an evaporating dish, evaporated to dry on a steam bath, and dried to constant weight in an electric constant temperature drying oven before weighing the non-volatile matter.

#### **A.7.2 Instruments and Equipment**

A.7.2.1 Electronic balance: with a sensitivity of 0.0001 g.

A.7.2.2 Ceramic evaporating dish: 50 mL.

A.7.2.3 Water bath pot.

A.7.2.4 Electric constant temperature drying oven: the temperature range can be controlled as 105°C to 110°C.

### A.7.3 Analysis Steps

Weigh about 4 g of the sample, precision to 0.0001 g, place it in a porcelain evaporating dish that has been dried to constant weight at 105 °C to 110 °C in advance. Add 10 mL of water. Evaporate on a steam bath until dry. Place in an electric constant temperature drying oven, dry at 105 °C to 110 °C for 1 hour, then cool in a dryer and weigh.

### A.7.4 Calculation of results

The mass fraction  $w_2$  of non-volatile substances, in milligrams per kilogram (mg/kg), is calculated according to formula (A.2):

$$w_2 = \frac{m_2 - m_3}{m_4} \times 10^6 \dots\dots\dots(A.2)$$

In which:

$m_2$ - the mass of non-volatile matter and evaporating dish after drying, in grams (g);

$m_3$ - the mass of the evaporating dish, in grams (g);

$m_4$ - the mass of the sample, in grams (g);

$10^6$ - Conversion factor.

The experimental results are based on the arithmetic mean of the parallel measurement results. The absolute difference between two independent measurement results obtained under repetitive conditions shall not exceed 10% of the arithmetic mean.

**END TRANSLATION**

### Attachments:

No Attachments.