# NATIONAL STANDARD OF THE

# PEOPLE'S REPUBLIC OF CHINA



# GB 1886.342-2021

## National food safety standard - Food additives - Ammonium aluminum sulfatehydrate

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## 1 Scope

This Standard applies to the food additive ammonium aluminum sulfatehydrate, which is produced with aluminum sulfate and ammonium sulfate as raw materials.

### 2.1 Molecular formula

Ammonium aluminum sulfate dodecahydrate: NH4Al(SO4)2.12H2O Ammonium aluminum sulfatehydrate: NH4Al(SO4)2

### 2.2 Relative molecular mass

Ammonium aluminum sulfate dodecahydrate: 453.31 (according to 2018 international relative atomic mass)

Ammonium aluminum sulfatehydrate: 237.13 (according to 2018 international relative atomic mass)

### 3.1 Sensory requirements

Sensory requirements shall be in accordance with Table 1.

Table 1 - Sensory requirements

### 3.2 Physical and chemical indicators

Physical and chemical indicators shall be in accordance with Table 2.

## Appendix A Inspection method

WARNING: Some reagents which are used in this test method are toxic or corrosive, so, be careful when operating! If necessary, perform it in a fume hood. If it is splashed on the skin, use water to rinse it immediately. If it is serious, seek medical attention immediately.

A.1 General provisions The reagents and water that are used in this Standard, when no

other requirements are specified, refer to analytical reagents and grade-III water which is specified in GB/T 6682. The standard titration solution, the standard solutions, preparations and products for impurity determination, which are used in the test, are all prepared in accordance with the provisions of GB/T 601, GB/T 602, and GB/T 603, when no other requirements are specified. The used solution, if not indicated which solvent is used, refers to aqueous solution.

A.2 Identification test A.2.1 Reagents and materials A.2.1.1 Sodium hydroxide solution: 100 g/L.

A.2.1.2 Barium chloride solution: 50 g/L.

A.2.1.3 Hydrochloric acid solution: 1+4.

A.2.1.4 Mercurous nitrate test paper: immerse the filter paper in a 50 g/L mercurous nitrate solution and take it out to dry.

A.2.1.5 Litmus test paper.

A.2.2 Identification method A.2.2.1 Identification of aluminum salt Take the sample aqueous solution, add sodium hydroxide solution, and white colloidal precipitation appears. The precipitate can be dissolved in excess sodium hydroxide solution.

A.2.2.2 Identification of sulfate Use a pipette to pipette 25 mL of sample solution A; place in a 250 mL conical flask; then, use the pipette to add 50 mL of Ethylene Diamine Tetraacetic Acid standard titration solution. Put a small piece of congo red test paper; use ammonia solution to adjust the test paper to purple-red (pH ~ 6); add 15 mL of acetic acid-sodium acetate buffer solution; boil for 3 min. After cooling, add 3 ~

## 4 drops of xylenol orange indicator solution; use lead nitrate standard titration

solution to titrate to orange-yellow as the end point.

Do a blank test at the same time.

For the blank test, except that no sample is added, the other operations and the type and amount of added reagents (except for the standard titration solution)

are the same as the determination test.

A.3.4 Result calculation The mass fraction w1 of ammonium aluminum sulfate dodecahydrate [AlNH4(SO4)2.12H2O] is calculated according to Formula (A.1).

Where:

V0 - volume of the lead nitrate standard titration solution that is consumed by the titration of the blank sample solution, in milliliters (mL);

V - volume of the lead nitrate standard titration solution that is consumed by the titration of the sample solution, in milliliters (mL);

c - exact value of the lead nitrate standard titration solution concentration, in moles per liter (mol/L);

M -- value of the molar mass of aluminum ammonium sulfate dodecahydrate [AlNH4(SO4)2.12H2O], in grams per mole (g/mol) (M = 453.33);

m - sample mass, in grams (g).

250 - volume of the sample solution, in milliliters (mL).

The mass fraction w2 of ammonium aluminum sulfatehydrate [AlNH4(SO4)2] is calculated according to Formula (A.2).

Where:

m2 - value of the mass of the sample before drying, in grams (g);

m3 - value of the mass of the sample after drying, in grams (g).

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.05%.

A.5 Determination of loss on drying A.5.1 Instruments and apparatuses A.5.1.1 Electrothermal constant-temperature dry box: The temperature control range is 200 °C +/- 2 °C.

A.5.1.2 Weighing bottle: dia. 50 mm x 30 mm.

A.5.2 Analysis steps Weigh about 6.0 g of the sample, accurate to 0.000 2 g; place it in a weighing bottle that has been previously placed in an electrothermal constant-temperature dry box at 200 °C +/- 2 °C to dry to a constant mass; dry it at 200 °C +/- 2 °C for 4 h.

A.5.3 Result calculation Calculate the mass fraction w4 of loss on drying according to Formula (A.4).

Where:

m4 - mass of the weighing bottle and the sample before drying, in grams (g);

m5 - mass of the weighing bottle and the sample after drying, in grams (g);

m6 - sample mass, in grams (g).

The test result is based on the arithmetic mean of the parallel determination results. The absolute difference between two independent determination results that are obtained under repeatability conditions is not more than 0.5%.

A.6 Determination of selenium (Se)

A.6.1 Reagents and materials