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National food safety standard - Food additives - Ammonium phosphate

食品安全国家标准 食品添加剂 磷酸氢二铵

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National food safety standard - Food additives - Ammonium phosphate

1 Scope

This Standard applies to the food additive ammonium phosphate that is produced with liquid ammonia and the food additive phosphoric acid (including wet-process phosphoric acid) as raw materials.

2 Molecular formula and relative molecular mass

2.1 Molecular formula

$(NH_4)_2HPO_4$

2.2 Relative molecular mass

132.06 (according to the international relative atomic mass in 2018)

3 Technical requirements

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.

Table 2 – Physical and chemical indicators

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 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 Nitric acid solution: 1+8.

A.2.1.2 Ammonia solution: 1+1.

A.2.1.3 Sodium hydroxide solution: 40 g/L.

A.2.1.4 Silver nitrate solution: 17 g/L.

A.2.1.5 Litmus red test paper.

A.2.2 Identification method

A.2.2.1 Identification of phosphate ion

Weigh about 1.0 g of the sample; dissolve it in 20 mL of water; use nitric acid solution to adjust the pH to neutral. Add silver nitrate solution, to produce a yellow precipitate. This precipitate is soluble in ammonia solution or nitric acid solution.

A.2.2.2 Identification of ammonium ion

Weigh about 1.0 g of the sample; dissolve it in 20 mL of water; add sodium hydroxide solution; the released ammonia gas can turn the wet litmus red test paper blue. Heating can promote the decomposition of the sample.

A.3 Determination of the content of ammonium phosphate [$(NH_4)_2HPO_4$]

A.3.1 Method summary

After the sample is dissolved, it reacts with formaldehyde to generate an acid equivalent to the content of ammonium salt. Use sodium hydroxide standard titration solution to titrate; use an acidity meter to indicate the end point. According to the volume of the consumed sodium hydroxide standard titration solution, calculate the content of ammonium phosphate.

A.3.2 Reagents and materials

A.3.2.1 Formaldehyde solution: 1+1.

A.3.2.2 Sodium hydroxide standard titration solution: c(NaOH) = 1 mol/L.

A.3.2.3 Carbon dioxide-free water.

A.3.3 Instruments and apparatuses

A.3.3.1 Acidity meter: resolution of 0.01 pH, equipped with glass electrode and saturated calomel electrode (or composite electrode).

A.3.3.2 Electromagnetic stirrer: equipped with a stirring rotor.

A.3.4 Analysis steps

Weigh about 1.8 g of the sample, accurate to 0.000 2 g; place it in a 150 mL beaker. Add 50 mL of carbon dioxide-free water; place it on the electromagnetic stirrer; put in the stirring rotor; stir until the sample is dissolved; add 40 mL of newly prepared formaldehyde solution; stir well and leave it for 30 min. Put the electrode of the calibrated acidity meter into the sample solution; use sodium hydroxide standard titration solution to titrate the pH to 8.9 as the end point; record the volume of consumed sodium hydroxide standard titration solution.

Do a blank test at the same time. Except that no sample is added, the type and amount of other reagents (except the standard titration solution) are the same as the sample solution.

A.3.5 Result calculation

The mass fraction w_1 of the content of ammonium phosphate [$(NH_4)_2HPO_4$] is calculated according to Formula (A.1).

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