NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

GB 1886.348-2021

National food safety standard - Food additives - Trisodium monohydrogen diphosphate

Issued on: February 22, 2021 **Implemented on: August 22, 2021**

Issued by: NHC; SAMR

Table of Contents

1 Scope

This standard applies to the food additive trisodium monohydrogen diphosphate, which is prepared by reaction, using the disodium dihydrogen pyrophosphate or phosphoric acid (including wet-process phosphoric acid) and sodium hydroxide as raw materials.

2 Chemical name, molecular formula, relative

molecular mass

2.1 Chemical name

Trisodium monohydrogen diphosphate, trisodium pyrophosphate, trisodium diphosphate

2.2 Molecular formula

Na3HP2O7.nH2O (n = 0 or 1)

2.3 Relative molecular mass

Anhydrous trisodium monohydrogen diphosphate: 243.93 (According to 2018 international relative atomic mass)

Monohydrate trisodium monohydrogen diphosphate: 261.94 (According to 2018 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall meet the requirements of Table 1.

Table 1 -- Sensory requirements

Appendix A Testing method

A.1 General provisions When the reagents and water, which are used in this standard, are not specified, they all refer to the analytically pure reagents and the grade 3 water, which

are specified in GB/T 6682. For the standard solutions used in the test, standard solutions for impurity determination, preparations and products, which are not specified otherwise, they are prepared in accordance with GB/T 601, GB/T 602,

GB/T 603. For the solution which is used in the test, it refers to the aqueous solution, when the solvent is not specified.

A.2 Identification test A.2.1 Reagents and materials A.2.1.1 Nitric acid solution: 1 + 1.

A.2.1.2 Quinmolybdenone solution.

A.2.2 Analytical procedures A.2.2.1 Identification of pyrophosphate Weigh 0.1 g of specimen. Place it in a beaker. Add 100 mL of nitric acid solution.

Stir to dissolve it. The resulting solution is test solution A. Measure 0.5 mL of test solution A. Add it dropwise into 30 mL of quinmolybdenone solution. The resulting solution is test solution B. Heat the remaining test solution A, at 95 °C, for 10 min. Take 0.5 mL of this solution. Add it dropwise into 30 mL of quinmolybdenone solution. The resulting solution is test solution C.

Judgment: Test solution C immediately forms a yellow precipitate, while test solution B does not.

A.2.2.2 Identification of sodium ions Weigh 1 g of specimen. Place it in a beaker. Add 20 mL of water to dissolve it.

Dip a platinum wire ring in hydrochloric acid. Burn it to colorless on the flame.

Dip the test solution. Burn it on the flame. The flame shall be bright yellow.

A.3 Determination of trisodium monohydrogen diphosphate content (calculated as burn-dry basis)

A.3.1 Method summary The mass fraction, w1, of the content of trisodium monohydrogen diphosphate (calculated on the burn-dry basis), is calculated according to formula (A.1).

Where:

0.0122 - The mass of anhydrous trisodium monohydrogen diphosphate, which is equivalent to 1 mL of 0.1 mol/L sodium hydroxide standard titration solution, in grams (g);

c - The concentration of sodium hydroxide standard titration solution, in moles per liter (mol/L);

V1 - The volume of the sodium hydroxide standard titration solution, which is consumed by the titration test solution, in milliliter (mL);

m - The mass of the specimen, in grams (g);

x1 - Loss on ignition, %;

50/500 - Conversion factor.

Take the arithmetic mean of the parallel determination results as the determination result. The absolute difference between the two parallel determination results is not more than 0.3%.

A.4 Determination of water insoluble A.4.1 Instruments and equipment A.4.1.1 Electric heating drying box.

A.4.1.2 Electronic balance, which has an accuracy of 0.001 g.

A.4.1.3 Glass sand crucible (pore size of filter plate is 5 um ~ 15 um).

A.4.2 Analytical procedures Weigh 20 g of specimen, accurate to 0.001 g. Place it in a 400 mL beaker. Add 200 mL of water and heat to dissolve. While it is hot, use a glass sand crucible, that has been dried to constant weight at 105 °C +/- 2 °C, to filter it. Use hot water to wash it 10 times (approximately 20 mL of water consumed each time). Dry it to constant weight at 105 °C +/- 2 °C.

A.4.3 Result calculation The mass fraction, w2, of water-insoluble is calculated according to formula A.7 Determination of lead A.7.1 Reagents and materials A.7.1.1 Hydrochloric acid.

A.7.1.2 Nitric acid.

A.7.1.3 Trichloromethane.

A.7.1.4 Sodium hydroxide solution: 250 g/L.

A.7.1.5 Ammonium pyrrolidine dithiocarbamate solution (APDC): 20 g/L, filter before use.

A.7.1.6 Lead standard solution: 1 mL of solution contains 0.010 mg of lead (Pb).

Pipette 1.00 mL of lead standard solution, which was prepared according to

HG/T 3696.2. Place it in a 100 mL volumetric flask. Use water to dilute it to the mark. Mix well. This solution is prepared before use.

A.7.1.7 Grade 2 water: It meets the requirements of GB/T 6682-2008.

A.7.2 Instruments and equipment Atomic absorption spectrometer: It is equipped with lead hollow cathode lamp.

A.7.3 Analytical method A.7.3.1 Preparation of test solution Weigh 10.0 g of sample (accurate to 0.01 g). Place it in a 150 mL beaker. Add

30 mL of water and a minimum amount of hydrochloric acid to dissolve the specimen. Add another 1 mL of hydrochloric acid, to ensure that the specimen is dissolved. Heat and boil for a few minutes. Cool it down. Use water to dilute it to 100 mL. Use sodium hydroxide solution to adjust the pH of the solution to 1.0 ~ 1.5. Transfer the solution quantitatively to a 250 mL separatory funnel.

Use water to dilute it to about 150 mL. Add 2 mL of ammonium pyrrolidine dithiocarbamate solution (APDC). Mix it. Use chloroform to extract twice. Add

20 mL each time. Collect the extract in a 50 mL beaker. Evaporate on a boiling water bath to almost dryness. Add 3 mL of nitric acid to the residue. Heat to almost dryness. Then add 0.5 mL of nitric acid and 10 mL of water. Heat to make it remains 3 mL ~ 5 mL. Transfer the nitrated extract to a 10 mL volumetric flask. Use water to dilute to the mark. Shake well.

A.7.3.2 Preparation of blank test solution Take 30 mL of water. Place it in a 150 mL beaker. Add 1 mL of hydrochloric acid.

The following operation is the same as "Heat and boil for a few minutes. Cool it