



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1886.233-2016

National food safety standard - Food additives - Vitamin E

食品安全国家标准 食品添加剂 维生素E

(English Translation)

Issued on: August 31, 2016

Implemented on: January 1, 2017

Issued by: National Health and Family Planning Commission of the PRC

Table of Contents

Foreword.....	3
1 Application Scope.....	4

Foreword

This Standard replaces GB 19191-2003, Food Additive. Natural Vitamin E.

Compared with GB 19191-2003, the major changes of this Standard are as follows.

-- Change the standard name into "National Food Safety Standard - Food Additive.

Vitamin E";

-- Modify the tocopherol species contained in vitamin E;

-- Add refractive index requirements;

-- Add absorption coefficient indicator requirements.

National Food Safety Standard -

Food Additive - Vitamin E

1 Application Scope

This standard applies to natural vitamin E extracted from by-products of natural edible vegetable oil or synthetic vitamin E, and products prepared from edible vegetable oil.

Vitamin E applicable to this standard includes the following tocopherol types. d-alpha-tocopherol, dl-alpha-tocopherol, d-alpha-tocopheryl acetate, dl-alpha-tocopheryl acetate, d-alpha-tocopheryl acid succinate, dl-alpha-tocopheryl acid succinate, d-alpha-tocopheryl acetate concentrate and mixed tocopherols concentrate.

2 Chemical Name, Molecular Formula, Structural Formula

and Relative Molecular Mass

2.3 structural formula

For d-alpha-tocopherol, dl-alpha-tocopherol, d-alpha-tocopheryl acetate, dl-alpha-tocopheryl acetate,

d-alpha-tocopheryl acid succinate, dl-alpha-tocopheryl acid succinate, d-alpha-tocopheryl acetate

concentrate and mixed tocopherols concentrate, the R1 group, R2 group, R3 group and R4 group corresponding to their structural formula are shown as Table 1.

2.4 Relative molecular mass

d-alpha-tocopherol. 430.71 (according to the international relative atomic mass in 2013);

dl-alpha-tocopherol. 430.71 (according to the international relative atomic mass in 2013);

d-alpha-tocopheryl acetate. 472.75 (according to the international relative atomic mass in 2013);

3.1 Sensory requirements

Sensory requirements should be in accordance with Table 2.

Appendix A

Test Method

A.1 General provisions

Unless otherwise specified in this standard, the purity of reagents used shall be above the grade of analytical reagent; the used standard titration solutions, the standard solutions for the determination of impurities, the preparations and products shall be prepared in accordance with the provisions of GB/T 601, GB/T 602 and GB/T 603; the test water should meet the requirements of grade-3 water specified by GB/T 6682.

The solution used in the test, 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 Absolute ethanol.

A.2.1.2 Nitric acid.

A.2.2 Identification method

A.3 Content determination

A.3.1 Reagents and materials

A.3.1.1 Cetyl palmitate.

A.3.1.2 alpha-tocopherol reference substance.

A.3.1.3 alpha-tocopheryl acetate reference substance.

A.3.1.4 alpha-tocopheryl acid succinate reference substance.

A.3.1.5 n-hexane.

A.3.2 Instruments and apparatuses

Gas chromatography.

A.3.3 Analysis steps

A.3.3.1 Determination of d-alpha-tocopherol content

A.3.3.1.2 Reference chromatographic conditions

SE-30 capillary column; hydrogen flame ion detector; keep the oven temperature at 250°C; the vaporization temperature and detection temperature are 300°C; the carrier gas is nitrogen; adjust the carrier gas flow rate to make the internal standard peak retention time at 18 min ~ 20 min. Inject 1 µL of the reference solution into the chromatograph; record the chromatogram.

A.3.3.1.3 Correction factor determination

Inject 1 µL of reference solution into the gas chromatograph; record the chromatogram; measure A_{ref1} , the peak area of the alpha-tocopherol, and A_{int1} , the peak area of the internal

standard peak; calculate the correction factor f_1 according to Formula (A.1).

A.3.3.1.4 Determination

Inject 1 µL of the sample solution into the gas chromatograph; record the chromatogram; calculate the peak area of alpha-tocopherol, beta- and gamma-tocopherol, and delta-tocopherol (A_{alpha2} , $A_{beta,gamma2}$, A_{delta2}); calculate the sum of the first three items (A_{t2}) and the

internal standard peak area A_{int2} ; calculate the content according to Formula (A.2) and Formula (A.3).

A.3.3.2.1 Solution preparation

The internal standard solution and the reference solution are the same as A.3.3.1.1.

Sample solution. weigh an appropriate amount of sample; accurate to 0.02 mg; place it in a brown volumetric flask; add internal standard solution to dilute to 10.0 mL; shake to dissolve to gain a solution containing d-beta-+d-gamma-tocopherol of about 1.5 mg/mL.

A.3.3.2.2 Reference chromatographic conditions

Same as A.3.3.1.2.

A.3.3.2.3 Correction factor determination

Same as A.3.3.1.3.

A.3.3.3.4 Determination

Inject 1 μ L of sample solution into the gas chromatograph; record the chromatogram.

Calculate $A_{sample7}$, the peak area of the alpha-tocopheryl acetate, and A_{int7} , the peak area

of the internal standard; calculate the content according to Formula (A.7).

A.6 Determination of absorbance coefficient

A.6.1 Reagents and materials

Absolute ethanol.

A.6.2 Instruments and apparatuses

Spectrophotometry.

A.6.3 Analysis steps

Weigh about 0.02 g of sample; accurate to 0.002 g; add absolute ethanol and dilute to

200 mL; shake well to obtain the sample solution. Take the sample solution in a 1 cm

cuvette; use absolute ethanol as a blank control; use spectrometer to measure the absorbance at 284 nm (control the absorbance between 0.2 and 0.8, otherwise adjust the concentration of the sample solution to re-measure the absorbance).