GB

NATIONAL STANDARD OF THE

PEOPLE'S REPUBLIC OF CHINA

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National Food Safety Standard -

Food Additives - Ascorbyl Palmitate

食品安全国家标准

食品添加剂 抗坏血酸棕榈酸酯

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Table of Contents

National Food Safety Standard - Food Additives - Ascorbyl Palmitate

1 Scope

This Standard applies to the ascorbyl palmitate, a food additive prepared by reacting palmitic acid with thionyl chloride to obtain palmitoyl chloride and reacting with ascorbic acid.

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

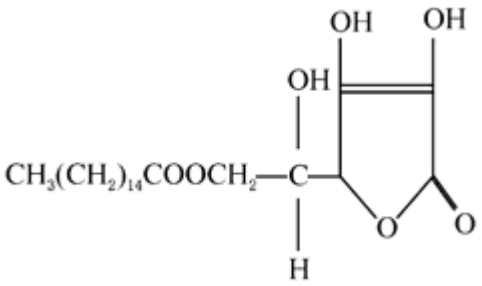
2.1 Chemical name

Ascorbic acid hexadecanoate

2.2 Molecular formula

$C_{22}H_{38}O_7$

2.3 Structural formula



2.4 Relative molecular mass

414.56 (according to 2013 international relative atomic mass)

3 Technical requirements

3.1 Sensory requirements

Sensory requirements shall be in accordance with Table 1.

USE iodometry. This product contains an enediol structure  in its structure, has strong reducibility, is easily oxidized by iodine solution to a diketone structure  , and simultaneously reduces iodine to form hydrogen iodide (HI).

A.3.2 Reagents and materials

A.3.2.1 Iodine standard titration solution: $c(\frac{1}{2}I_2)$=0.1 mol/L.

A.3.2.2 Absolute ethanol.

A.3.3 Analytical procedures

WEIGH about 0.3 g (accurate to 0.0002 g) of sample; PLACE it into a 250 mL conical flask; ADD 50 mL of absolute ethanol to dissolve it; ADD 30 mL of water and shake well. Immediately USE the iodine standard titration solution to titrate, until yellow appears and remains 30 s without fading as the end point. RECORD the volume (mL) of the iodine standard titration solution consumed.

A.3.4 Result calculation

Ascorbyl palmitate content ($C_{22}H_{38}O_7$) w_1 is calculated according to formula (A.1):

$$w_1 = \frac{V \times c_1 \times 0.207\ 3}{m_1} \times 100\% \qquad \text{.....(A.1)}$$

Where:

V - The volume of the iodine standard titration solution consumed by titrating the sample, in milliliters (mL);

c_1 - The concentration of the iodine standard titration solution, in moles per liter (mol/L);

0.2073 - The mass of ascorbyl palmitate expressed in grams equivalent to 1.00 mL of iodine standard titration solution [$c(\frac{1}{2}I_2)$=1.000 mol/L];

m_1 - The mass of sample weighed, in grams (g).

The test result is based on the arithmetic mean of parallel determination results.

A.5.1.3 Balance: The sensitivity is 0.0001 g.

A.5.1.4 Flat weighing bottle.

A.5.2 Analytical procedures

WEIGH about 1 g (accurate to 0.0001 g) of sample; PLACE it into a constant-weight weighing bottle. Then, PLACE the weighing bottle in a vacuum drying oven; at 56 °C~60 °C, about 2.67 kPa (20 mmHg), DRY for 1 h. After the pressure in the vacuum drying oven returns to normal, TAKE the weighing bottle out. PLACE the weighing bottle into a dryer; COOL to room temperature and weigh.

A.5.3 Result calculation

The mass fraction w_2 of loss on drying is calculated according to the formula (A.3):

$$w_2 = \frac{m_2 - m_3}{m_2} \times 100\% \qquad \cdots\cdots (A.3)$$

Where:

m_2 - The sample mass before drying, in grams (g);

m_3 - The sample mass after drying, in grams (g).

A.6 Determination of residue on ignition

A.6.1 Reagents and materials

Sulfuric acid.

A.6.2 Analytical procedures

WEIGH 1 g of sample (accurate to 0.01 g); PLACE it into a porcelain crucible which has been burned at 700 °C~800 °C to a constant weight. First, USE a small fire to slowly heat until completely carbonized. After cooling, ADD 0.5 mL~1.0 mL of sulfuric acid to make it moist. After heating at low temperature until the sulfuric acid vapor is removed, MOVE it into a high temperature furnace and burn it at 700 °C~800 °C to a constant weight.

A.6.3 Result calculation

Residue on ignition w_3 is calculated according to formula (A.4):

$$w_3 = \frac{m_4 - m_5}{m_6} \times 100\% \qquad \cdots\cdots (A.4)$$

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