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

GB 31620-2014

**National Food Safety Standard -- Food Additives -
?-apo-8-carotenal**

食品安全国家标准 食品添加剂 β -阿朴-8'-胡萝卜素醛
(English Translation)

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1 Scope

This standard applies to the carotenoid used in the production of synthesis intermediates, after Wittig reaction polymerization food prepared by adding Agent beta- apo-8'-carotene aldehyde. It contains minor amounts of other carotenoids.

2 Molecular formula, relative molecular mass and structural formula

Formula 2.1

C₃₀H₄₀O.

2.3 Relative molecular mass

416.65 (according to 2007 international relative atomic mass).

3.1 Sensory requirements

Shall comply with the requirements in Table 1.

Table 1 Sensory requirements

Project requires test methods Dark purple color with a metallic luster State crystal or crystalline powder Take the right amount of sample is placed in a clean, dry white porcelain dish, under natural light, Views its color and state police

3.2 Physical and Chemical Indicators

Shall comply with the provisions of Table 2.

Table 2. Physical and chemical indicators

Item Index Test Method Content () /% >= 96 Appendix A A. 3 Other coloring matter () /% <=

3 A. 4 Residue on ignition (%) ≤ 0.1 A. 5 Lead (Pb)/(mg/kg) ≤ 2 GB 5009.12 Note. The commercialization of beta- apo-8'-carotene aldehyde product shall comply with the standard beta- apo-8'-carotene aldehyde as raw materials can be added antioxidants, emulsifying Agents and other excipients, which was formulated as a suspension in edible oil suspensions or water-soluble powder.

Appendix A

Testing method

A. 1. GENERAL PROVISIONS Unless otherwise specified in this standard, the use of analytical reagent purity should be more than the standard titration solution, standard solution for measuring impurities, Preparations and products, should be GB/T 601, GB/T 602, the provisions of GB/T 603 preparation, test water shall comply with GB/T 6682's.

Solution was used in the tests did not indicate what is formulated with solvent, it refers to an aqueous solution.

A. 2 Identification Test A. 2.1 Solubility Test Insoluble in water, slightly soluble in ethanol, slightly soluble in vegetable oil, soluble in chloroform.

A. 2.2 Test of carotenoids A. 2.2.1 Reagents and materials A. 2.2.1.1 acetone.

A. 2.2.1.2 sodium nitrite solution. 50g/L.

A. 2.2.1.3 sulfuric acid solution. 0.5mol/L.

A. 2.2.2 Analysis of step Acetone solution of the sample preparation. Continuous to sample liquid dripping Gaja nitrate solution and sulfuric acid solution, sample solution color gradually disappear.

A. 2.3 Spectrophotometers Determination of the sample solution (A.3.3.1) absorbance at 461nm and 488nm at the ratio A_{488}/A_{461} should be between 0.80 to 0.84.

A. Determination of 3 content A. 3.1 Reagents and materials A. 3.1.1 chloroform.

A. 3.1.2 cyclohexane.

A. 3.2 instruments and equipment Spectrophotometer.

A. 3.3 Analysis Steps A. 3.3.1 Preparation of sample solution Weigh the sample $0.08g \pm 0.01g$, placed in 100mL flask, add chloroform 20mL sample dissolution, dilute to the mark with cyclohexane Degree, shake. Take this sample solution 5.0mL to another 100mL volumetric flask, dilute to the mark with cyclohexane, shake. Take this diluted solution 5.0mL in third 100mL volumetric flask, dilute with cyclohexane to the mark, shake, to give a sample solution.

A. 3.3.2 Determination the sample solution was placed 1cm cuvette with cyclohexane blank control, using a spectrophotometer at a wavelength of 461nm at the determination of

absorption Luminosity.

Note: The above operation should be completed as soon as possible to avoid exposure to the air, we should ensure that all operations are to avoid direct sunlight.

A. 3.4 Calculation Results beta- apo-8'-carotene aldehyde (C₃₀H₄₀O) the content of the mass fraction of 1 according to formula (A.1) Calculated.

$A_1 \times 40000$

$M_1 \times 100$

2640 x

100% (A.1)

Where.

A₁ --- absorbance of the sample solution;

--- 40000 dilution;

Mass m₁ --- sample in grams (g);

100 --- conversion factor;

2640 --- beta- apo-8'-carotene aldehyde absorption coefficient in cyclohexane.

A. Determination of 4 other coloring matter A. 4.1 Reagents and materials A. 4.1.1 chloroform.

A. Methanol solution 4.1.2 KOH. 30g/L.

A. 4.1.3 eluent. n-hexane + chloroform + ethyl acetate = 70 + 20 + 10.

A. 4.1.4 TLC plates. silica gel, thickness 0.25mm.

A. 4.2 instruments and equipment Spectrophotometer.

A. 4.3 Analysis Steps A. Pretreatment 4.3.1 TLC plate the TLC plate was immersed in a methanol solution of potassium hydroxide to completely wet the manipulation, and then remove the thin layer plate, dried in air 5min, placed Cooled and stored stand 110 °C ± 2 °C oven activation 1h, placed in a dryer equipped with calcium chloride.

A. 4.3.2 Preparation of sample solution Weigh about 0.08g sample, accurate to 0.001g, dissolved in 100mL of chloroform. Take 400μL of the solution is uniformly location like to leave TLC plate on the bottom edge of the baseline 2cm. After spotting, immediately in advance with developing solvent saturated chromatography tank expand appropriately dark, until the agent Line moves to the forefront at a distance of 10cm baseline. Remove the TLC plate, most of the volatile solvent, mark primary chromatographic bands and other carotenoids at room temperature Bu Su appropriate chromatographic bands. Pipette containing silica gel chromatography absorbent main strip, into a 100mL stoppered

centrifuge tube, was added 40.0mL Chloroform (solution 1). Pipette containing silica gel absorbent corresponding chromatogram with other carotenoids, transferred to another branch 50mL stoppered away Heart tube was added 20.0mL chloroform (solution 2). Mechanical shaking tube 10min, then centrifuged 5min. Take 10.0mL the solution was diluted with chloroform to 1 50.0mL (solution 3).

A. 4.3.3 Determination Solution 2 and Solution 3 placed respectively 1cm cuvette, chloroform do blank, with a suitable spectrophotometer at maximum Absorption wavelength (474nm) absorbance was measured.

A. 4.4 Calculation Results Other coloring matter (beta- apo-8'-carotene, other carotenoids, except aldehyde) mass fraction of 2 according to equation (A.2) Calculated.

$A_2 \times 10$

$\times 100\%$ (A.2)

Where.

Solution absorbance A_2 --- 2;

10 --- solution concentration ratio;

A_3 --- solution absorbance 3.

A. 5 Determination of residue on ignition A. 5.1 Reagents and materials sulfuric acid.

A. 5.2 Analysis Steps Weigh about 2g samples, accurate to 0.0002g, burned to constant weight has been placed in a crucible at $800\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$, low heat and slowly heat to sample completely carbonized, after cooling, add about 1.0mL of sulfuric acid to make it moist, low-temperature sulfuric acid heated to steam divisible, moved into a high temperature furnace at $800\text{ }^{\circ}\text{C} \pm 25\text{ }^{\circ}\text{C}$ burned to constant weight.

A. 5.3 Calculation Results Burning residue mass fraction 3 according to formula (A.3) Calculated.

$M_1 - m_1$

$\times 100\%$

Where.

M_1 --- debris and empty crucible mass in grams (g);

Mass m_1 2 --- empty crucible in grams (g);

M_1 --- sample mass, in grams (g).