



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

GB 1886.105-2016

**National Food Safety Standard -- Food additives -- Pepper
Orange**

食品安全国家标准 食品添加剂 辣椒橙

(English Translation)

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1 Scope

This standard applies to the pepper peel and its products as raw materials, by extraction, filtration, concentration, succinate and other products made of food additives Pepper orange.

2.1 Molecular formula

Capsaicin. C₄₀H₅₆O₃

Chrysanthemum. C₄₀H₅₆O₄

2.2 Structural formula

Capsaicin.

Chrysanthemum.

2.3 Relative molecular mass

Capsicumoids. 584.87 (according to 2007 International relative atomic mass)

Chrysanthemum hemp. 600.87 (according to the 2007 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 sensory requirements

The project requires a test method Colorful orange or orange-red State oily liquid Take appropriate sample in a clean, dry, transparent glass tube Under light, observe the color

and state

3.2 Physical and chemical indicators

Physical and chemical indicators should be consistent with the provisions of Table 2.

Table 2 Physical and chemical indicators

Item Index Test Method the total amount of carotenoids, w /% is consistent with the assertion of A.3 in Appendix A.

Pepper total alkaloid/($\mu\text{g/mL}$) in accordance with claim A.4 in Appendix A.

Capsaicin and pepper heme, w /% $\geq 30\%$ of the total carotenoid content Appendix A A.5
Total Organic Solvent Residue/(mg/kg) ≤ 50 Appendix A A.6 Arsenic (As)/(mg/kg) ≤ 3.0
Appendix A A.7 Lead (Pb)/(mg/kg) ≤ 2.0 GB 5009.12 Note. Commercial pepper orange products should be in line with this standard pepper orange as raw material, can add edible dextrin, antioxidants and other accessories made.

Appendix A

Testing method

A.1 General provisions the reagents and water used in this standard refer to the pure reagent and the tertiary water specified in GB/T 6682 when no other requirements are specified. test in the standard titration solution, impurity determination with the standard solution, preparation and products, in the absence of other requirements, according to GB/T 601, GB/T 602 and GB/T 603. The solution used in the test refers to the aqueous solution when it is not specified in the formulation of the solvent.

A.2 Identification test A.2.1 Reagents and materials A.2.1.1 Sulfuric acid.

A.2.1.2 Trichloromethane.

A.2.1.3 Acetone.

A.2.1.4 n-hexane.

A.2.2 Identification method A.2.2.1 Color reaction Add 1 drop of 3 drops of trichloromethane and 1 drop of sulfuric acid to 1 drop of the sample. The solution was dark blue.

A.2.2.2 Maximum absorption the sample was dissolved in acetone and had a maximum absorption peak at about 462 nm. The sample was dissolved in n-hexane and had a maximum at about 470 nm Absorption peak.

A.3 Determination of total carotenoid content A.3.1 Methodological Summary

Spectrophotometric method was used to determine the absorbance of carotenoids in pepper orange at the maximum absorption wavelength (about 462nm).

content.

A.3.2 Reagents and materials acetone.

A.3.3 Instruments and equipment A.3.3.1 Spectrophotometer.

A.3.3.2 Cuvette. 10mm.

A.3.4 Analysis steps A.3.4.1 Preparation of sample solution Weigh 0.3g ~ 0.5g sample (accurate to 0.0002g), placed in 100mL volumetric flask, dissolved with acetone and diluted to the mark, standing 2min. Absorb 1mL of the solution, placed in another 100mL volumetric flask, fixed with acetone to the scale, full shake.

A.3.4.2 Determination the sample solution was placed in a 10 mm cuvette and the absorbance A was read at the maximum absorption wavelength (about 462 nm). Adjust the sample concentration, So that the absorbance between 0.3 to 0.7.

A.3.5 Calculation of results the mass fraction of carotenoids, w_1 , is calculated according to formula (A.1) $w_1 = A_0 \times 104 \times 2100 \times m_1$ (A.1) where.

A_0 --- absorbance value of sample solution;

104 - dilution factor of sample solution;

2100 --- Percent Absorption Coefficient of Pepper Red/Pepper Rutin at 462nm in Acetone E1 m;

m_1 --- the quality of the sample, in grams (g).

The result of the calculation indicates one after the decimal point.

A.4 Determination of total alkaloids in peppers A.4.1 Methodological Summary
Determination of total alkaloids of pepper (reduced dihydrocapsaicin, capsaicin and dihydro capsaicin) by high performance liquid chromatography.

A.4.2 Reagents and materials A.4.2.1 Ethanol.

A.4.2.2 Acetone.

A.4.2.3 acetonitrile.

A.4.2.4 Acetic acid solution. 1 99.

A.4.2.5 Synthetic capsaicin standard, purity $\geq 99\%$.

A.4.3 Instruments and equipment A.4.3.1 High performance liquid chromatograph. with 20 μ L dosing ring, equipped with fluorescence detector or UV detector.

A.4.3.2 Solid phase extraction cartridge. Sep-PAKC186mL, or other equivalent solid phase extraction cartridge.

A.4.4 Reference chromatographic conditions A.4.4.1 Column. C18 stainless steel column,

150 mm x 4.6 mm, particle size 5 m, or other equivalent column.

A.4.4.2 Mobile phase. acetonitrile. acetic acid solution = 40.60.

A.4.4.3 Mobile phase flow rate. 1.5 mL/min.

A.4.4.4 Detection wavelength. Fluorescence detector excitation wavelength 280nm, emission wavelength 325nm; UV detector detection wavelength 280nm.

A.4.4.5 Injection volume. 20 µL.

A.4.5 Analysis steps
A.4.5.1 Preparation of standard solutions Weigh 75mg synthetic capsaicin standard, accurate to 0.01mg, placed in 500mL volumetric flask, diluted with ethanol diluted to the mark, Shake, the solution for the standard solution A (mass concentration of 150µg/mL). Absorb 10mL standard solution A, placed in 100mL volumetric flask, Diluted with ethanol to the mark, shake, the solution for the standard solution B (mass concentration of 15µg/mL). Draw 5mL standard solution B, placed in a 100mL volumetric flask, diluted with ethanol to the mark, shake, the solution for the standard solution C (mass concentration of 0.75µg/mL).

A.4.5.2 Preparation of sample solution Weigh 5g sample, accurate to 0.0001g, placed in 50mL volumetric flask, to avoid the sample stick to the volumetric flask wall. Add 5mL Acetone, shake until the sample is completely dissolved. Tilt the 45 ° angle to see if the specimen is attached to the bottom of the bottle. Slowly add ethanol (95% or absolute ethanol) Until the solution is turbid, diluted to the scale, mixed evenly. Use a 10 mL syringe to draw 5 mL of the sample solution directly to a size of 6 mL in the solid phase extraction column, the sample is allowed to adhere to the inner wall of the syringe. The sample was passed through a column and collected in a 25 mL volumetric flask. use 5mL ethanol wash the extraction column, washed three times, the washing liquid collected to the volumetric flask, with ethanol constant volume to the scale, through the 0.45µm filter Filter, the filtrate into the glass bottle.

A.4.5.3 Determination Under the conditions of A.4.4 reference chromatography, the sample solution and standard solution were chromatographed respectively. Record the sample solution in the chromatogram the peak area of the capsaicin, the peak area of the capsaicin, the peak area of the dihydrocapsaicin, and the standard of the standard solution Peak area AS.

A.4.6 Calculation of results the concentration of rhoN, in micrograms per milliliter (µg/mL), is calculated according to formula (A.2) $\rho_{\text{N}} = \frac{A_{\text{N}}}{A_{\text{S}}} \times \rho_{\text{S}} \times r_{\text{N}}$ (A.2) where.

AN - the average peak area of dihydrolipid base;

AS --- the average peak area of the standard;

rhoS --- Mass concentration of standard solution in micrograms per milliliter (µg/mL);

The response factor of rN - reduced dihydrocapsin relative standard.