



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

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National Food Safety Standard -- Food Additives -- Turmeric

食品安全国家标准 食品添加剂 姜黄

(English Translation)

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1 Scope

This standard applies to plants Zingiberaceae turmeric (Turmeric, *Curcuma Longa* L.) Roots as raw material, organic solvent extraction Refined food additives turmeric.

2.1 Chemical Name

Curcumin. 1,7-bis (4-hydroxy-3-methoxyphenyl) hept-1,6-diene-3,5-dione
Bisdemethoxycurcumin. 1- (4-hydroxyphenyl) -7- (4-hydroxy-3-methoxyphenyl)
hept-1,6-diene-3,5-dione Bis Bisdemethoxycurcumin. 1,7-bis (4-hydroxyphenyl)
hept-1,6-diene-dione Formula 2.2 Curcumin. C₂₁H₂₀O₆ Bisdemethoxycurcumin.
C₂₀H₁₈O₅ Double Bisdemethoxycurcumin. C₁₉H₁₆O₄

2.3 Formula

Curcumin. R₁ = R₂ = OCH₃ Bisdemethoxycurcumin. R₁ = OCH₃, R₂ = H Double
Bisdemethoxycurcumin. R₁ = R₂ = H

2.4 Relative molecular mass

Curcumin. 368.39 (according to 2007 international relative atomic mass)
Bisdemethoxycurcumin. 338.39 (according to 2007 international relative atomic mass)
Double Bisdemethoxycurcumin. 308.39 (according to 2007 international relative atomic mass)

3.1 Sensory requirements

Sensory requirements shall comply with the requirements of Table 1.

Table 1 Sensory requirements

Project requires test methods Yellow to dark red-brown color the state of powder, or liquid extract Turmeric has a smell peculiar smell Take appropriate sample is placed in a clean, dry glass dish, in Observation of natural light and color of its status, its taste and olfactory

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

project

index

Extract powder, liquid Testing method the color value of E1 m (425 ± 5) nm conform claimed in Appendix A A.3 Loss on drying, w /% ≤ 10 - GB 5009.3 Distillation Lead (Pb)/(mg/kg) ≤ 5.0 GB 5009.75 Total arsenic (As)/(mg/kg) ≤ 3.0 GB 5009.11 Residual solvents (hexane, ethyl acetate and isopropanol)/(mg/kg) ≤ 50 Appendix A A.4

Note 1: The commercialization of turmeric products should comply with this standard turmeric as a raw material, may be added dextrin, edible ethanol and/or in compliance with the quality specifications of food additives Requirements emulsifiers and thickeners.

Note 2: the extraction solvent is ethanol, acetone, the 6th light gasoline, hexane, isopropanol and/or ethyl acetate.

Appendix A

Testing method

A.1 General Provisions this standard reagents and water, did not indicate when the other requirements, refer to the three water analytical reagent and GB/T 6682 stipulated. test in the standard titration solution, impurity measurement standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and GB/T 603 provisions prepared. 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 color reaction Weigh quality equivalent to 0.1g, the color value of a sample of 150, was dissolved in 200mL of ethanol, the solution should microstrip yellow green fluorescence.

Weigh quality equivalent to 1g, color value for the sample of 150, was dissolved in 100mL of ethanol, adding hydrochloric acid until the solution becomes pale orange color, this

solution is a sample solution. Boric acid in a sample solution, the solution should be a reddish orange.

A.2.2 maximum absorption wavelength Take A.3.3 color value measurement of the sample solution by spectrophotometer at 420nm ~ 430nm wavelength should be between the maximum absorption Closing peak.

A.2.3 TLC

A.2.3.1 silica gel thin layer plate production method Weigh silica gel 10g, add water, 20mL, placed ground in a mortar into a suitable dilute thick slurry uniformly coated on a glass plate, the coating thickness 0.5mm, 100 °C activation 30min.

A.2.3.2 developer

Ethanol .3- methyl-1-butanol. water. ammonia = 4.4.2.1.

A.2.3.3 Preparation of sample solution Weigh quality equivalent to 1g, color value for the sample of 150, was dissolved in 100mL of ethanol at about 3000r/min centrifugation 10min, the supernatant of the sample solution.

A.2.3.4 spotting

Silica gel TLC plate, using a micro syringe 5μL sample was spotted.

A.2.3.5 expand and observation the good points like sheet previously been placed with developing solvent saturated chromatography tank, press the up method to expand, when the solvent front to be more than 10cm, Removed, air-dried. Observation should be at least two yellow spots, Rf value should be between 0.40 to 0.85. All spots in UV light (approximately 366nm) should be significantly under yellow fluorescent.

A.3 Determination of the color value of E1 m (425 ± 5) nm of A.3.1 Instruments and Equipment Spectrophotometer.

A.3.2 Reagents and solutions 95% ethanol.

A.3.3 Analysis step

Weigh 0.1g ~ 0.3g powder sample, accurate to 0.0002g, or weigh 1g extract or liquid sample, accurate to 0.0002g, with 95% ethanol was dissolved and transferred to 100mL volumetric flask, add 95% ethanol to the mark, shake, and then draw 10mL, transferred to 100mL volumetric flask, add 95% ethanol to the mark, shake, if the solution is cloudy, filter paper can be used to obtain a sample solution. Take this sample 1cm cuvette was placed in 95% ethanol as blank using a spectrophotometer at 420nm ~ 430nm wavelength of maximum absorption within Measuring the absorbance (Absorbance should be controlled between 0.2 to 0.8, or should adjust the concentration of the sample, and then re-measured absorbance) at.

A.3.4 Calculation Results the color value of E1 m (425 ± 5) nm, according to formula (A.1)

Calculated.

$E1\text{ m } (425 \pm 5)\text{ nm} =$

$c \times 100$

Where.

A --- measured absorbance of the sample solution;

c --- concentration of the sample solution to be tested, in grams per milliliter (g/mL);

100 --- concentration conversion factor.

The results parallel arithmetic mean of the measurement results shall prevail. Twice under the same condition of independent determination results obtained absolute difference not more than 5% of the arithmetic mean.

A.4 Determination of residual solvents (hexane, ethyl acetate and isopropanol) of A.4.1 Instruments and Equipment Gas chromatograph with flame ionization detector (FID) and headspace sampler.

A.4.2 Reagents and solutions A.4.2.1 standard component to be measured. n-hexane, ethyl acetate and isopropanol, chromatography.

A.4.2.2 blank. containing very little solvent sample.

A.4.2.3 3- methyl-2-pentanone. chromatography, internal standard was used.

A.4.2.4 dimethylformamide (DMF). chromatography.

A.4.3 reference chromatographic conditions A.4.3.1 Column. fused silica capillary column, length 30m, internal diameter 0.53mm, the coating is 100% dimethyl polysiloxane, coating thickness 5 μ m. Or equivalent column.

A.4.3.2 carrier gas. high purity nitrogen.

A.4.3.3 carrier gas flow rate. 2mL/min.

A.4.3.4 Column temperature. 40 °C to maintain 5min, to 5 °C/min temperature was raised to 90 °C, holding 6min.

A.4.3.5 inlet temperature. 140 °C.

A.4.3.6 detector temperature. 300 °C.

A.4.3.7 Injection. Split injection, split ratio of 1.10; injection volume of 1.0mL.

A.4.4 headspace sampler reference conditions A.4.4.1 Sample heating temperature. 60 °C.

A.4.4.2 sample heating time. 40min.

A.4.4.3 Injector temperature. 70 °C.