



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

GB 1886.110-2015

**National Food Safety Standard -- Food Additives -- Natural
amaranth**

食品安全国家标准 食品添加剂 天然苋菜红

(English Translation)

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1 Scope

This standard applies to red amaranth (AmaranthustricolorL.) Edible part of the raw material, water extraction, purification obtained in ethanol Natural Food Additives Amaranth.

2 Molecular formula, relative molecular mass and structural formula

Formula 2.1

Amaranth glycosides. $C_{30}H_{34}O_{19}N_2$ Betanin. $C_{24}H_{26}O_{13}N_2$

2.2 Formula

Amaranth glycosides. R = beta-D- glucopyranosyl uronic acid Betanin. R = H

2.3 Relative molecular mass

Amaranth glycosides. 726.56 (according to 2007 international relative atomic mass)

Betanin. 550.48 (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 Color purple Status amorphous powder Take the right amount of sample is placed in a clean, dry 50mL beaker , Under natural light, visually observe its color and status

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 color value of E1 m (535nm) ≥ 6.0 Appendix A A.3 pH 6.0 ~ 8.0 in Appendix A A.4 Loss on drying, w /% ≤ 10.0 Appendix A A.5 Residue on ignition, w /% ≤ 35.0 A.6 in Appendix A Arsenic (As)/(mg/kg) ≤ 2.0 GB 5009.76 Heavy metals (Pb)/(mg/kg) ≤ 15.0 GB 5009.74

NOTE: Amaranth commercialization of natural products shall comply with this standard natural Amaranth as raw material, add edible dextrin, antioxidants and other accessories made of.

Appendix A

Testing method

A.1 General Provisions this standard reagents and water, did not indicate when the other requirements, refer to analytical reagent and third grade water GB/T 6682 regulations.

Standard solutions used in the tests, impurity standard solution, preparations and products, did not indicate when the other requirements, according to GB/T 601, GB/T 602 and the provisions of GB/T 603 formulation. 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 Soluble in water and dilute ethanol, purple clarity liquid, soluble in ethanol, ethyl ether, petroleum ether and other organic solvents.

A.2.2 color reaction Acidic or neutral aqueous solution of this product is purple liquid clarity, when an alkaline aqueous solution having a pH in 9 above, then quickly turned from purple Turns yellow.

A.2.3 maximum absorption wavelength A.2.3.1 Reagents and materials Acetic acid - sodium acetate buffer. pH5.4.

A.2.3.2 instruments and equipment Spectrophotometer.

A.2.3.3 analysis step Accurately weighed sample 0.1g (accurate to 0.002g), acetic acid - sodium acetate buffer solution is diluted to volume in 100mL flask, shake After measured using a spectrophotometer, the sample solution in the vicinity of 535nm wavelength of maximum absorption peak.

A.2.4 paper chromatography A.2.4.1 Reagents and developer A.2.4.1.1 methanol.

A.2.4.1.2 butanol.

A.2.4.1.3 eluent. methanol. water. n-butanol = 60.30.10 (volume ratio).

A.2.4.2 instruments and equipment A.2.4.2.1 chromatography tank.

A.2.4.2.2 capillaries.

A.2.4.3 analysis step the developer added chromatography tank, allowing chromatography tank vapor space as the agent fully saturated. About 2.0cm at the end point of the pigment from the paper Aqueous solution of the sample, the spot diameter of not more than 2mm, repeatedly spotted, air-dried, immersed cylinder chromatography developing solvent, the upstream expansion method $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$. The mobile phase solvent to be moved away from the origin of about 10cm, remove the filter paper with a pencil to draw solvent front, solvent evaporated to dryness to Purple spots pencil to draw the shape. Purple spots Rf value averaged 0.46 ± 0.03 .

A.2.4.4 Calculation Results Rf Rf, according to equation (A.1) Calculated.

Where.

b --- the origin to the center from the purple spots centimeters (cm);

a --- from the origin to the solvent front in centimeters (cm).

A.3 color value E1 m (535nm) Determination A.3.1 Reagents and materials Acetic acid - sodium acetate buffer. pH5.4.

A.3.2 Instruments and Equipment Spectrophotometer.

A.3.3 Analysis step

Accurately weighed sample 0.1g (accurate to 0.0002g), acetic acid - sodium acetate buffer (pH5.4) was dissolved, and set the volume to 100mL volume Bottle, shake, this solution as the sample solution to be tested. If the solution is too dark, use the same dilution buffer. With the same buffer as control, in 1cm cuvette, the absorbance of the sample solution (A) measured at 535nm wavelength.

A.3.4 Calculation Results the color value of E1 m (535nm), according to equation (A.2) Calculated.

E1 m (535nm) =

Where.

A --- absorbance reading of the sample solution, requires between 0.3 and 0.7;

f --- dilution factor of the sample;

m1 --- sample mass, in grams (g).

The arithmetic mean of the measurement results to the parallel determination results shall prevail.

A.4 pH measurement

This product will be formulated in a 1% aqueous solution weighed in precision pH meter.

A.5 Determination of loss on drying A.5.1 Analysis step 3g accurately weighed sample of the (accurate to 0.001g) to have been dried to a constant weight of 105 °C ± 2 °C weighing bottle and placed 105 °C ± Oven temperature 2 °C in dry 4h, cooled to room temperature in a dryer, said to constant weight.

A.5.2 Calculation Results Loss on drying mass fraction w_1 , according to equation (A.3) Calculated.

$m_2 - m_3$

100% (A.3)

Where.

m_2 --- weighing bottle plus the quality of the sample, in grams (g);

m_3 after drying --- weighing bottle plus the quality of the sample, in grams (g);

m_4 --- sample mass, in grams (g).

The arithmetic mean of the measurement results to the parallel determination results shall prevail, twice under the same condition of independent determination results obtained absolute difference Value of not greater than 1.13% of the arithmetic mean.

A.6 Determination of residue on ignition A.6.1 measuring step 3g accurately weighed sample of the (accurate to 0.001g), placed in a burned to constant weight porcelain crucible at 700 °C ~ 800 °C. First low temperature Charring (about 300 °C), and then high temperature carbonization (about 500 °C), and finally by 700 °C ~ 800 °C ashing to constant weight in a high temperature furnace.

A.6.2 Calculation Results Burning residue mass fraction w_2 , according to equation (A.4) Calculated.

$m_5 - m_6$

100% (A.4)

Where.

Quality m_5 --- crucible and residue on ignition in grams (g);

m_6 --- empty crucible mass in grams (g);

m_7 --- sample mass, in grams (g).

The arithmetic mean of the measurement results to the parallel determination results shall prevail, twice under the same condition of independent determination results obtained absolute difference Value of not greater than 1.10% of the arithmetic mean.