



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

GB 28314-2012

Food additives - Capsicum oleoresin

食品添加剂 辣椒油树脂

(English Translation)

Issued on: April 25, 2012

Implemented on: June 25, 2012

Issued by: Ministry of Health of the People's Republic of China

Table of Contents

1 Scope...	3
2 Molecular Formula, Structural Formula, and Relative Molecular Mass...	3
3 Technical Requirements...	4
Appendix A Test Methods...	5

1 Scope

This Standard applies to the food additive capsicum oleoresin which is made from the fruit of the Solanaceae plant Capsicum (Capsicum annuum L.) through processing and refining.

2 Molecular Formula, Structural Formula, and Relative

Molecular Mass

2.1 Capsaicin

Molecular formula. $C_{18}H_{27}NO_3$

Structural formula.

Relative molecular mass. 305.41 (according to the 2007 international relative atomic mass)

2.2 Dihydrocapsaicin

Molecular formula. $C_{18}H_{29}NO_3$

Structural formula.

Relative molecular mass. 307.43 (according to the 2007 international relative atomic mass)

2.3 Nordihydrocapsaicin

Molecular formula. $C_{17}H_{25}NO_3$

Appendix A

Test Methods

A.1 General

The reagents and water used in this Standard, unless otherwise specified, refer to analytical reagents and Grade-3 water specified in GB/T 6682. The standard titration

solution, standard solution for impurity determination, preparations and products used in the test, unless otherwise specified, are prepared in accordance with the provisions of GB/T 601, GB/T 602 and GB/T

603. The solutions used in the test, unless otherwise specified, refer to aqueous solutions.

A.2.1 Solubility

Almost insoluble in water, partially soluble in ethanol, insoluble in glycerol.

A.2.2 Maximum absorption peak

The n-hexane solution of the sample has a maximum absorption peak near a wavelength of 445 nm.

A.2.3 Color reaction

Take 1 drop of capsicum oleoresin sample; add 2~3 drops of chloroform and 1 drop of sulfuric acid; the solution turns brown to dark blue.

A.3.1.1 Reagents and materials

A.3.1.1.1 Methanol. Chromatographically pure.

A.3.1.1.2 Tetrahydrofuran. Chromatographically pure.

A.3.1.1.3 Methanol-tetrahydrofuran mixed solvent. Volume ratio is 1.1.

A.3.1.1.4 Capsaicin standard product (purity $\geq 95\%$).

A.3.1.1.5 Dihydrocapsaicin standard product (purity $\geq 90\%$).

A.3.1.1.6 Standard stock solution. Accurately weigh appropriate amounts of capsaicin standard product and dihydrocapsaicin standard product, accurate to 0.0001 g; dissolve in methanol and make constant volume. Prepare a mixed standard stock solution of capsaicin and dihydrocapsaicin with a concentration of 1 mg/mL; seal it and store it in a refrigerator at 4 °C for later use.

A.3.1.1.7 Standard working solution. Respectively pipette 0 mL, 0.5 mL, 1 mL, 1.5 mL, 2.0 mL and 2.5 mL of the standard stock solution; and then make constant volumes to 25 mL with methanol, respectively. The concentrations of this standard series are 0 $\mu\text{g/mL}$, 20 $\mu\text{g/mL}$, 40

$\mu\text{g/mL}$, 60 $\mu\text{g/mL}$, 80 $\mu\text{g/mL}$ and 100 $\mu\text{g/mL}$; and prepare it for immediate use.

A.3.1.2 Instruments and equipment

A.3.1.2.1 High performance liquid chromatograph. Equipped with ultraviolet detector.

A.3.1.2.2 Analytical balance (with sensitivity of 0.0001 g).

A.3.1.2.3 Analytical balance (with sensitivity of 0.001 g).

A.3.1.3 Reference chromatographic conditions

A.3.1.3.1 Chromatographic column. C18, 4.6 mm x 250 mm, 5 μ m (or other equivalent chromatographic columns).

A.3.1.3.2 Mobile phase. methanol-water solution, volume ratio of 65:35.

A.3.1.3.3 Injection volume. 10 μ L.

A.3.1.3.4 Flow rate. 1 mL/min.

A.3.1.3.5 UV detection wavelength. 280 nm.

A.3.1.3.6 Column oven temperature. 30 $^{\circ}$ C.

A.3.1.4 Analysis procedures

A.3.1.4.1 Preparation of specimen solution

Accurately weigh an appropriate amount of specimen (take 1.000 g when the capsaicin content is about 1%; take 0.500 g when it is about 2%, and so on); dissolve it in a methanol-tetrahydrofuran mixed solvent and dilute it to 100 mL; filter it through a 0.45 μ m filter membrane and set aside. This is the specimen solution.

A.3.1.4.2 Determination

Perform chromatographic analysis on the specimen solution and the standard working solution according to the reference chromatographic conditions in A.3.1.3. Draw a standard curve based on the contents of capsaicin and dihydrocapsaicin in the standard working solution; use the retention time of the chromatographic peak of the standard substance for qualitative analysis;

and use the standard curve of capsaicin and dihydrocapsaicin and the peak area in the specimen solution for quantitative analysis.

.....