



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

GB 1886.241-2016

**National Food Safety Standard -- Food Additives -- Glycyrrhizic
Acid Tripotassium**

食品安全国家标准 食品添加剂 甘草酸三钾

(English Translation)

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1 Scope

This standard is based on Glycyrrhizauralensis Fisch, Glycyrrhizain flate, (GlycyrrhizaglabraL.) Dried roots and rhizomes as raw materials, after extraction, concentration, potash and drying process the food additive is three potassium glycyrrhizinate.

2.1 Chemical name

Three potassium

2.3 Molecular formula

C₄₂H₅₉K₃O₁₆

2.4 Relative molecular mass

937.20 (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

The project requires a test method Color status Yellow to brown powder Take the appropriate amount of sample in a clean, dry white porcelain dish Under the 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 (In dry basis), w /% $\geq$ 10.0 Appendix A, A.3 pH (1% aqueous solution) 6 to 8 GB/T 9724 Dry reduction, w /% $\leq$ 8 GB 5009.3 direct drying method Burning residue, w /% $\leq$ 27 GB/T 9741a Total arsenic (in As)/(mg/kg) $\leq$ 2.0 GB 5009.11 Lead (Pb)/(mg/kg) $\leq$ 2.0 GB 5009.12 a 700 ° C to 800 ° C.

Appendix A

Testing method

A.1 General provisions the reagents and water used in this standard, when not specified in other requirements, refer to the analysis of pure reagents and GB/T 6682 provides three levels of water. test the standard solution, impurity standard solution, preparation and preparation used in the test shall be classified according to GB/T 601, GB/T 602, 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 hydrochloric acid.

A.2.2 Identification of potassium ions Take platinum wire, wet with hydrochloric acid, dipped in the sample, in the colorless flame burning, blue glass glass perspective, the flame was purple.

A.3 Determination of the content of tripotassium glycyrrhizinate (calculated as the dry basis) A.3.1 Methodological Summary the sample was dissolved into glycyrrhizic by dissolving, filtered and determined by liquid chromatography (UV detector), external standard method. When calculating the results, try the mass of the sample is the mass of the sample minus the mass of the drying reduction in the sample. As a result, the 18-beta-potassium trihydrate (C₄₂H₅₉K₃O₁₆).

A.3.2 Reagents and materials A.3.2.1 Methanol. liquid chromatography grade.

A.3.2.2 glacial acetic acid. excellent grade pure.

A.3.2.3 Water. Level 1 water specified in GB/T 6682.

A.3.2.4 Mobile phase solution. Methanol glacial acetic acid (71 1 28), mix well and filter through 0.45 μ m filter (organic) Degassed.

A.3.2.5 Glycyrrhizic acid monoammonium reference substance. purity $\geq$ 95% (determined by liquid chromatography).

A.3.3 Instruments and equipment High performance liquid chromatograph with UV detector.

A.3.4 Analysis steps A.3.4.1 Preparation of reference solution Weigh about 20mg (accurate to 0.01mg) glycyrrhizic acid monoammonium reference substance, dissolved with mobile phase solution, and constant volume to 100mL, shake.

A.3.4.2 Preparation of sample solution Approximately 100 mg (accurate to 0.01 mg) of the potassium triphosphate sample was weighed and placed in a 100 mL volumetric flask and dissolved in a mobile phase solution.

To the scale, the 0.45μm filter (organic) filter, to be measured.

A.3.4.3 Reference chromatographic conditions A.3.4.3.1 Column. 250 mm long, 4.6 mm in inner diameter, 5 μm in diameter, and C18 column. Or the equivalent separation effect of the column.

A.3.4.3.2 mobile phase. methanol acetic acid aqueous solution.

A.3.4.3.3 Flow rate. 1.0 mL/min.

A.3.4.3.4 Column temperature. room temperature.

A.3.4.3.5 Detection wavelength. 250 nm.

A.3.4.3.6 Injection volume. 10 μL.

A.3.4.4 Determination Followed by injection of reference substance solution and sample solution, external standard method quantitative. The high performance liquid chromatogram of glycyrrhizic acid is shown in Appendix B.

A.3.5 Calculation of results the mass fraction w_1 of the contents of tripotassium glycyrrhizinate (calculated as the dry basis) is calculated according to formula (A.1) $w_1 = 1.12 \times V \times c_s \times A_m \times (1 - w_2) \times A_s \times 100\%$ (A.1) where.

1.12 --- conversion of glycyrrhizic acid monoammonium salt into the conversion factor of potassium trihydrate;

V --- sample volume, in milliliters (mL);

c_s - the concentration of monoammonium glycyrrhizinate in the reference solution, in milligrams per milliliter (mg/mL);

A - the peak area of glycyrrhizic acid in sample solution;

m --- the quality of the sample in milligrams (mg);

w_2 --- sample dry reduction of the content,%;

A_s - the peak area of glycyrrhizic acid in the reference solution.

The results of the test are based on the arithmetic mean of the parallel measurement results (1 decimal place is reserved). Two independent tests obtained under repetitive conditions the absolute difference of the result is not more than 5% of the arithmetic mean.

Appendix B

Glycyrrhetic acid for liquid chromatography and the reference retention time for each component B.1 Schematic diagram of glycyrrhizic acid by liquid chromatography the schematic diagram of liquid chromatography of glycyrrhizic acid is shown in Figure B.1.

Description.

1 - 24 - hydroxy glycyrrhizic acid;

2 --- 18-beta glycyrrhizic acid;

3 --- 18-alpha Glycyrrhizic acid.

Figure B.1 Schematic representation of glycyrrhizic acid by liquid chromatography

B.2 Glycyrrhizic acid components for reference retention time

Table B.1 Reference retention time for each component of glycyrrhizic acid

Finger number	Component name	Retention time a/min
1	24-Hydroxy Glycyrrhizic Acid	7.0
2	18-beta glycyrrhizic acid	8.1
3	18-alpha Glycyrrhizic acid	10.0

the retention times of the components of different instruments, different separation columns, and even at different times are different, but the elution order of each component is constant.