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

GB/T 18932.22-2003

**Method for the determination of fructose, glucose, sucrose,
maltose contents in honey -- Liquid chromatography refractive
index detection method**

(English Translation)

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Foreword

This Part of GB/T 18932 equivalently adopts the Canadian Standard ACC-017-V2.0 "Method for the determination of carbohydrate - Liquid chromatography method". It only modifies some minor contents.

Appendix A of this Part is informative.

This Part was proposed by Qinhuangdao Entry - Exit Inspection and Quarantine Bureau of the People's Republic of China.

This Part shall be under the jurisdiction of All China Federation of Supply and Marketing Cooperatives.

The main drafting organization of this Part. Qinhuangdao Entry - Exit Inspection and Quarantine Bureau of the People's Republic of China.

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This Part was issued as a national standard for the first time.

Method for the determination of fructose, glucose,

sucrose, maltose contents in honey - Liquid
chromatography refractive index detection method

1 Scope

This Part of GB/T 18932 specifies the method for the determination of fructose, glucose, sucrose, maltose contents in honey.

This Part is applicable to the determination of fructose, glucose, sucrose, maltose contents in honey.

The method detection limit of this Part. fructose, glucose, and sucrose are 0.5%; maltose is 0.2%.

2 Normative references

The following standards contain the provisions which, through reference in this Part of the GB/T18932, constitute the provisions of this Part. For the dated references, all subsequent amendments (excluding corrections) or revisions do not apply to this Part. However, the parties who enter into agreement based on this Part are encouraged to investigate whether the latest versions of these standards are applicable. For undated reference documents, the latest versions apply to this Part.

GB/T 6379 Precision of test methods - Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests (GB/T 6379-1986, neq ISO 5725.1981)

GB/T 6682 Water for analytical laboratory use - Specification and test methods (GB/T 6682-1992, neq ISO 3696.1987)

3 Principles

Use water to dissolve the sample. After acetonitrile volume is constant, filter it with 0.45 µm filterable membrane. Use the liquid chromatography refractive index detector to determine. And adopt the external standard method to quantify.

5.2 Analytical balance. two balances of which one's sensitivity is 0.1 mg, and the other's sensitivity is 0.01 g.

6.1 Sample preparation

For non-crystalized laboratory sample, stir it evenly. For crystalized sample, in a closed circumstance, place the crystalized sample in the water bath at no more than 60°C; warm it; oscillate it till it is totally melted; stir it and cool it to room temperature. Take 0.5 kg as the sample. Place the prepared sample in the sample flask, seal and mark it.

6.2 Sample storage

Store the sample at room temperature.

7.1 Extraction

Weigh 5 g of sample, accurate to 0.001 g. Place it into a 50 mL beaker; add 30 mL of water. Use a glass rod to stir and make the sample completely dissolved. Transfer it to a 100 mL flask. Use 10 mL of water to wash the beaker for three times. Then transfer it to the aforementioned 100 mL flask. Use acetonitrile to make the constant volume; mix it evenly. Use 0.45 µm filter membrane to filter the sample solution into the sample flask for liquid chromatography.

7.2.1 Liquid chromatography conditions

- a) Chromatographic column. carbohydrate analysis column 10µm, 300mmx3.9 mm (i.d);
- b) Mobile phase. acetonitrile + water (77+23);
- c) Flow rate. 1.0 mL/min;

Where,

X - component content in the determined sample, in grams per 100 grams (g/100 g);

c - solution concentration of determined components, obtained from the standard work curve, in grams per 100 milliliters (g/100 mL);

V - constant volume of sample solution, in milliliters (mL);

m - mass of weighed sample, in grams (g).

Note: The blank value shall be deducted from the result.

9 Precision

The precision data in this Part is determined in accordance with the provisions of GB/T 6379. The repeatability and reproducibility values are calculated in 95% confidence.

9.1 Repeatability

Under conditions of repeatability, the absolute difference between two independent test results obtained shall not exceed the repeatability limit (r). The content range of fructose, glucose, sucrose and maltose in honey and repeatability equation are shown in Table 2.

Table 2 The Content Range, Repeatability Equation and Reproducibility Equation

Name	Content Range (g/100g)	Repeatability Limit (r)	Reproducibility Limit (R)
Fructose	21.31~39.62	$r = -0.0095 m + 0.5420$	$\lg R = 0.4529 \lg m - 0.5978$
Glucose	20.54~36.15	$r = -0.0094 m + 0.4127$	$\lg R = 0.0905 \lg m - 0.4236$
Sucrose	0.22~5.95	$r = -0.0115 m + 0.1579$	$\lg R = 0.0011 m + 0.2149$
Maltose	0.98~6.99	$r = -0.0047 m + 0.1623$	$\lg R = 0.1474 \lg m - 0.8122$

If the difference exceeds the repeatability limit (r), then the test result shall be discarded, and recomplete the determinations of two independent tests.

9.2 Reproducibility

Under conditions of reproducibility, the absolute difference between two independent test results obtained shall not exceed the reproducibility limit (R). The content range of fructose, glucose, sucrose and maltose in honey and reproducibility equation are shown in Table 2.

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