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GB 5009.262-2016

National Food Safety Standard –

Determination of Solvent Residual in Food

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Foreword

This Standard replaces “4.8 Determination of solvent residual” of GB/T 5009.37-2003, *Method for Analysis of Hygienic Standard of Edible Oils*, and “6 Determination of solvent residual” of GB/T 5009.117-2003, *Method for Analysis of Hygienic Standard of Edible Soybean Meal*.

Compared with GB/T 5009.37-2003 and GB/T 5009.117-2003, the major changes of this Standard are as follows:

-- it changes the standard name into “*National Food Safety Standard – Determination of Solvent Residual in Food*”;

-- it modifies the method for analysis of solvent residual;

-- it modifies the method for plotting standard curves;

-- it modifies the calculation formula of results.

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National Food Safety Standard –

Determination of Solvent Residual in Food

1 Application Scope

This Standard specifies the method for determination of solvent residual in edible vegetable oils and edible soybean meal.

This Standard applies to the determination of solvent residual in edible vegetable oils and edible soybean meal.

2 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

2.1 Matrix vegetable oil

Refined vegetable oil obtained through the refining processes including colour and odour removal, or vegetable oil produced by ultrasonic degassing at room temperature, of the same species as that of specimen to be tested. The solvent residual in matrix vegetable oil shall be lower than the detection limit.

2.2 Matrix meal

Edible meal of the same species as that of specimen to be tested, which is fully removed of solvent residual by further processing or laboratory heating. The solvent residual of matrix meal shall be lower than the detection limit.

3 Principle

The solvent residual existing in specimen will diffuse to gas phase in a closed container; after a certain time, the dynamic equilibrium between the concentrations of gas phase and liquid phase can be achieved; the content of solvent residual in the upper gas phase is measured by headspace gas chromatography, i.e. the actual content of solvent residual in specimen to be tested can be calculated.

4 Reagents and Materials

Unless specified otherwise, all reagents used for this method are analytically pure and the water is of grade 1 water specified in GB/T 6682.

4.1 Reagents

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b) column temperature program: maintain for 3 min at 50°C; increase temperature to 55°C at the rate of 1°C/min and maintain for 3 min; increase temperature to 200°C at the rate of 30°C/min and maintain for 3 min;

c) injection port temperature: 250°C;

d) detector temperature: 300°C;

e) injection mode: the split mode with split ratio 100:1;

f) carrier nitrogen flow rate: 1 mL/min;

g) hydrogen flow rate: 25 mL/min;

h) air flow rate: 300 mL/min.

6.3 Plotting of standard curves

6.3.1 For vegetable oils, the internal standard method is used in this method for quantitation. After analyzing the prepared standard solution on machine, plot the standard curve using the concentration ratio of standard solution to internal standard material as the abscissa, and the ratio of the total peak area of standard solution to the peak area of internal standard material as the abscissa.

6.3.2 For meals, the external standard method is used in this method for qualification. After analyzing the prepared standard solution on machine, plot the standard curve using the concentration of standard solution as the abscissa, and the total peak area of standard solution as the abscissa.

6.4 Specimen determination

After analyzing the prepared vegetable oil or meal specimen, measure its peak area and calculate the solvent residual in specimen in accordance with relevant standard curves.

7 Expression of Analytical Results

The content of solvent residual in specimen is calculated in accordance with Formula (1):

$$X = \rho \qquad \cdots\cdots(1)$$

where,

X—the content of solvent residual in specimen, in mg/kg;

ρ—the content of solvent residual in specimen obtained from standard curve, in mg/kg.

Keep three significant digits for the calculation results.

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