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GB/T 5532-2022 / ISO 3961:2018

Replacing GB/T 5532-2008

Animal and vegetable fats and oils - Determination of iodine value

动植物油脂 碘值的测定

(ISO 3961:2018, IDT)

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Standardization Administration of PRC.

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Foreword

This document was drafted in accordance with the provisions of GB/T 1.1-2020 *Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents*.

This document replaces GB/T 5532-2008 *Animal and vegetable fats and oils - Determination of iodine value*. Compared with GB/T 5532-2008, except for the structural adjustment and editorial changes, the main technical changes are as follows:

-- The requirement of mixing solvents by equal volume (50 mL) is added (see 5.5);

-- The storage method of Wijs reagent is added (see 5.6);

-- The instrument requirements for volumetric flasks, pipettes, and burettes are added (see 6.4, 6.5, and 6.6);

-- Table 1 is changed (see Table 1; see Table 1 of the 2008 edition);

-- The requirements for preheating and sealing are added in the test procedure (see 9.1);

-- The requirements for rounding off the determination results are changed (see Table 2; see Table 2 of the 2008 edition);

-- The contents that the requirement to indicate all necessary identification information of the sample in the test report and the test method refers to the international standard are added (see Chapter 12; see Chapter 12 of the 2008 edition).

This document is identical to ISO 3961:2018 *Animal and vegetable fats and oils - Determination of iodine value*.

The following editorial changes have been made to this document:

-- The relevant formulas are numbered.

Please note that some of the contents of this document may involve patents. The issuing agency of this document is not responsible for identifying patents.

This document was proposed by the National Food and Strategic Reserves Administration.

This document shall be under the jurisdiction of the National Technical Committee on Grains and Oils of Standardization Administration of China (SAC/TC270).

Animal and vegetable fats and oils - Determination of iodine value

1 Scope

This document specifies a method for the determination of the iodine value of animal and vegetable fats and oils.

Appendix B describes a method for the calculation of the iodine value according to fatty acid compositional data. This method is not applicable to fish oils. Furthermore, for cold-pressed, unrefined animal and vegetable oils as well as (partially) hydrogenated oils, different results can be obtained by the two methods. The calculated iodine value is affected by impurities and thermal degradation products.

NOTE: The method is based upon the official method Cd 1c-85 of American Oil Chemists Society (AOCS).

2 Normative references

The following documents contain the provisions which, through normative reference in this document, constitute the essential provisions of this document. For the dated referenced documents, only the versions with the indicated dates are applicable to this document; for the undated referenced documents, only the latest version (including all the amendments) is applicable to this document.

ISO 661 Animal and vegetable fats and oils - Preparation of test sample

NOTE: GB/T 15687-2008 Animal and vegetable fats and oils - Preparation of test sample (ISO 661:2003, IDT)

3 Terms and definitions

The following terms and definitions are applicable to this document.

The terminological databases of ISO and IEC can be accessed at the following URL:

-- ISO: https://www.iso.org/obp

-- IEC: http://www.electropedia.org/

3.1 iodine value

The mass of halogen absorbed by a sample of a certain mass under the operating conditions specified in this document.

NOTE: It is expressed as the grams of iodine absorbed per 100 g of fat.

4 Principle

The sample is dissolved in solvent and then Wijs reagent is added for reaction. After a specified time, potassium iodide and water are added, and then the solution is titrated with sodium thiosulfate solution to obtain free iodine.

5 Reagents

WARNING -- Attention is drawn to the regulations that specify the handling of hazardous substances. The relevant technical, organizational, and personal safety regulations shall be followed. Wijs reagent may cause severe burns; vapours can cause lung and eye damage. A fume hood shall be used for the work.

5.1 Unless otherwise stated, all reagents used in this document are of analytical grade. The water shall meet the relevant grade regulations.

5.2 Potassium iodide solution (KI): 100 g/L, not containing iodate or free iodine.

5.3 Starch solution: Mix 5 g of soluble starch in 30 mL of water, add 1000 mL of boiling water, boil for 3 min, and cool it. Prepare fresh starch solution every day.

5.4 Sodium thiosulfate standard solution: $c(Na_2S_2O_3 \cdot 5H_2O)$=0.1 mol/L, standardized not more than 7 days before use.

5.5 Solvent: It is prepared by mixing one volume of cyclohexane (50 mL) and one volume of glacial acetic acid (50 mL), volume fractions φ=50 mL/100 mL.

5.6 Wijs reagent: It is acetic acid containing iodine monochloride. The iodine/chlorine ratio of the Wijs reagent shall be within the limits of 1.10±0.1. Wijs reagent is sensitive to temperature, moisture, and light, thus it shall be stored in a brown bottle below 30 °C and protected from light.

The commercially available Wijs reagent can be used, and the reagent shall be ensured within the shelf life.

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