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Animal and vegetable fats and oils — Determination of iodine value

Corps gras d'origines animale et végétale — Détermination de l'indice d'iode

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Contents

Page

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 11, *Animal and vegetable fats and oils*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 307, *Oilseeds, vegetable and animal fats and oils and their by-products - Methods of sampling and analysis*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This seventh edition cancels and replaces the sixth edition (ISO 3961:2018), of which it constitutes a minor revision.

The changes are as follows:

— entry errors have been corrected in Table 1.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Animal and vegetable fats and oils — Determination of iodine value

1 Scope

This document specifies a reference method for the determination of the iodine value (commonly known in the industry as IV) of animal and vegetable fats and oils, hereinafter referred to as fats.

Annex B describes a method for the calculation of the IV from fatty acid compositional data. This method is not applicable to fish oils. Furthermore, cold-pressed, crude and unrefined vegetable oils as well as (partially) hydrogenated oils can give different results by the two methods. The calculated IV is affected by impurities and thermal degradation products.

NOTE The method in Annex B is based upon the AOCS Official method Cd 1c-85[10].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 661, *Animal and vegetable fats and oils — Preparation of test sample*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
iodine value
IV
mass of halogen, expressed as iodine, absorbed by the test portion following the specified procedure, divided by the mass of the test portion

Note 1 to entry: The IV is expressed as a mass fraction in grams per 100 g of fat.

4 Principle

Dissolution of a test portion in solvent and addition of Wijs reagent. After a specified time, addition of potassium iodide and water, and titration of the liberated iodine with sodium thiosulfate solution.

NOTE Annex B describes a method for the calculation of the IV from fatty acid compositional data. However, this is not intended to be a rapid method. The method gives two results from one analytical procedure. The volumetric method is the reference method.

5 Reagents

Use only reagents of recognized analytical grade.

WARNING — Attention is drawn to the regulations which specify the handling of hazardous substances. Technical, organizational and personal safety measures shall be followed. Wijs reagent causes severe burns; vapours can cause lung and eye damage. A fume hood shall be used for the work.

5.1 Water, in accordance with ISO 3696[4], grade 3.

5.2 Potassium iodide solution, mass concentration, ρ(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 (5.1) and add to 1 000 ml of boiling water. Boil for 3 min and allow to cool. Prepare fresh starch solution every day.

5.4 Sodium thiosulfate, standard volumetric solution, amount of substance concentration $c(Na_2S_2O_3{\cdot}5H_2O)$ = 0,1 mol/l, standardized not more than 7 days before use.

5.5 Solvent, 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, containing iodine monochloride in acetic acid. The I/Cl ratio of the Wijs reagent shall be within the limits 1,10 ± 0,1. Wijs reagent is sensitive to temperature, moisture, and light. Store in the dark at < 30 °C.

Use commercially available Wijs reagent. Observe any shelf-life limitation of the reagent.

6 Apparatus

Usual laboratory apparatus and, in particular, the following.

6.1 Glass weighing scoops, suitable for the test portion and for insertion into the flasks (6.2).

6.2 Conical flasks, capacity 500 ml, fitted with ground glass stoppers and showing no evidence of the presence of moisture.

6.3 Analytical balance, readability 0,000 1 g and weighing accuracy 0,001 g.

6.4 Volumetric flask, capacity 1 000 ml, ISO 1042[3], class A.

6.5 Pipette, capacity 25 ml, automatic, ISO 8655-2[7], or ISO 648[2], class A, fitted with an aspiration bulb.

6.6 Burette, capacity 25 ml and 50 ml, graduated in 0,1 ml divisions, ISO 385[1], class A, autotitrator, ISO 8655-3[8], as an alternative.

7 Sampling

Sampling is not part of the method specified in this document. A recommended sampling method is given in ISO 5555[5].

It is important the laboratory receive a truly representative sample which has not been damaged or changed during transport or storage.