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Animal and vegetable fats and oils — Determination of trace elements by inductively coupled plasma optical emission spectroscopy (ICP-OES)

Corps gras d'origines animale et végétale — Détermination des éléments traces par spectrométrie d'émission optique à plasma induit par haute fréquence (ICP-OES)

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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*.

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This second edition cancels and replaces the first edition (ISO 21033:2016), which has been technically revised.

The main changes are as follows:

— Table 1 has been revised for phosphorus to include an additional emission line also listed in ISO 10540-3 and used in the collaborative study reported by AOCS/FOSFA International (1998/1999), see Tables B.1 and B.2;

— additional elements and emission lines have been added to Table 1 (elements not subjected to the collaborative study are indicated in Table 1).

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Introduction

This document is based on AOCS Official Method Ca 17a-18[1].

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Animal and vegetable fats and oils — Determination of trace elements by inductively coupled plasma optical emission spectroscopy (ICP-OES)

1 Scope

This document specifies an inductively coupled plasma optical emission spectroscopic method (ICP-OES) for the determination of trace elements present in a solubilized form in most types of vegetable fats and oils. Depending on the dilution solvent used, most types of vegetable oils can be analysed (crude, degummed, refined, bleached, deodorized and hardened oils) and nearly all types of lecithins and phosphatides.

Elements present in fine particles, such as bleaching earth, metal particles and rust, can result in poor recovery of the trace elements present as nebulization and atomization problems affect the ICP-OES analysis.

This document does not apply to milk and milk products (including fat coming from milk and milk products).

NOTE The only suitable non-ashing direct method for samples containing fine particles is graphite furnace atomic absorption spectrometry.

2 Normative references

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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.

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

ISO 6353-2, *Reagents for chemical analysis — Part 2: Specifications — First series*

ISO 6353-3, *Reagents for chemical analysis — Part 3: Specifications — Second series*

3 Terms and definitions

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

ISO and IEC maintain terminology 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
trace element
element present in mg/kg concentrations

Note 1 to entry: Trace element content is expressed as a mass fraction in milligrams per kilogram.

4 Principle

Solvent-diluted vegetable oils are analysed for trace elements by direct aspiration. Liquid samples are nebulized and carried into the excitation source by a flowing gas. Atoms are quantified by measuring the specific emission lines produced by atoms decaying from high energy levels.

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