SLOVENSKI STANDARD
SIST EN ISO 20122:2024

01-junij-2024

Rastlinska olja - Določevanje nasičenih ogljikovodikov mineralnih olj (MOAH) in aromatskih ogljikovodikov mineralnih olj (MOAH) z on-line sklopljeno analizo s tekočinsko kromatografijo visoke ločljivosti in plinsko kromatografijo v povezavi s plamenskim ionizacijskim detektorjem (HPLC-GC-FID) - Metoda za nizko mejo določljivosti (ISO 20122:2024)

Vegetable oils - Determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH) with online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID) analysis - Method for low limit of quantification (ISO 20122:2024)

Pflanzliche Öle - Bestimmung von gesättigten Mineralölkohlenwasserstoffen (MOSH) und aromatischen Kohlenwasserstoffen (MOAH) mit online gekoppelter HPLC-GC-FID-Analyse - Verfahren für die niedrige Bestimmungsgrenze (ISO 20122:2024)

Huiles végétales - Dosage des hydrocarbures saturés d'huile minérale (MOSH) et des hydrocarbures aromatiques d'huile minérale (MOAH) par analyse par chromatographie en phase liquide haute performance et chromatographie en phase gazeuse couplées à un détecteur à ionisation de flamme (CLHP-CG-FID) en ligne - Méthode pour une faible limite de quantification (ISO 20122:2024)

Ta slovenski standard je istoveten z: **EN ISO 20122:2024**

ICS:

67.200.10	Rastlinske in živalske maščobe in olja	Animal and vegetable fats and oils

SIST EN ISO 20122:2024 **en,fr,de**

EUROPEAN STANDARD

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English Version

Vegetable oils - Determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH) with online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID) analysis - Method for low limit of quantification (ISO 20122:2024)

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Pflanzliche Öle - Bestimmung von gesättigten Mineralölkohlenwasserstoffen (MOSH) und aromatischen Kohlenwasserstoffen (MOAH) mit online gekoppelter HPLC-GC-FID-Analyse - Verfahren für die niedrige Bestimmungsgrenze (ISO 20122:2024)

This European Standard was approved by CEN on 12 January 2024.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN ISO 20122:2024) has been prepared by Technical Committee ISO/TC 34 "Food products" in collaboration with Technical Committee CEN/TC 307 “Oilseeds, vegetable and animal fats and oils and their by-products - Methods of sampling and analysis” the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2024, and conflicting national standards shall be withdrawn at the latest by October 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 20122:2024 has been approved by CEN as EN ISO 20122:2024 without any modification.

International Standard

ISO 20122

First edition
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Vegetable oils — Determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH) with online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID) analysis — Method for low limit of quantification

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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).

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.

Introduction

In order to achieve a low limit of quantification (LOQ), the method contains additional and partially modified processing steps, specifications for the uniform processing of defined product groups and additional requirements for system suitability compared to EN 16995:2017.

The method has been tested in an interlaboratory study via the analysis of both naturally contaminated and spiked vegetable oil samples, ranging from 1 mg/kg to 75 mg/kg for MOSH, and from 1 mg/kg to 7 mg/kg for MOAH.

Vegetable oils — Determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH) with online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID) analysis — Method for low limit of quantification

1 Scope

This document specifies a procedure for the determination of saturated and aromatic hydrocarbons (from C10 to C50) in vegetable fats and oils using the online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID).[4][5][6] This document does not apply to other matrices.

The method is applicable for the analysis of mineral oil saturated hydrocarbons (MOSH) and/or mineral oil aromatic hydrocarbons (MOAH).

According to the results of the interlaboratory studies, the method has been proven suitable for MOSH mass concentrations above 3 mg/kg and MOAH mass concentrations above 2 mg/kg.

In case of suspected interferences, the fossil origin of the MOSH and MOAH fraction can be verified by examination by GC×GC-MS.

An alternative method for the epoxidation of the MOAH fraction (performic acid epoxidation) is proposed in Annex C. This alternative method provides comparable results to the ethanolic epoxidation of the MOAH fraction described in 8.6. This alternative method for epoxidation has proven to be efficient for samples with a high amount of interferences in the MOAH fraction (e.g. tropical oils).[14]

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 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
mineral oil saturated hydrocarbons
MOSH
paraffinic (open-chain, usually branched) and naphthenic (cyclic, alkylated) hydrocarbons in the boiling range of *n*-alkanes with a chain length of 10 to 50 carbon atoms, which are obtained from mineral oil by this method by means of online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID)

3.2
mineral oil aromatic hydrocarbons
MOAH
aromatic mainly alkylated hydrocarbons from mineral oil in the boiling range of *n*-alkanes with a chain length of 10 to 50 carbon atoms, determined by means of online-coupled high performance liquid chromatography-gas chromatography-flame ionization detection (HPLC-GC-FID)

3.3
unresolved complex mixture
UCM
complex mixture of saturated or aromatic hydrocarbons not resolved by gas chromatography such as branched paraffins, alkylated naphthenes and alkylated aromatics, that produces a hump when analysed by gas chromatography-flame ionization detection (GC-FID)

3.4
polyolefin oligomeric saturated hydrocarbons
POSH
synthetic hydrocarbons from oligomers of polyolefins, such as polyethylene, polypropylene and polybutylenes

Note 1 to entry: Food contact uses comprise plastic bags, containers or films, heat sealable layers and other lamination as well as adhesives and plasticizers.

Note 2 to entry: POSH can be distinguished from mineral oil saturated hydrocarbons (MOSH) by their chromatographic pattern, but it is difficult to differentiate and chromatographically separate them from the MOSH if both are present.[5]

3.5
resin oligomeric saturated hydrocarbons
ROSH
synthetic saturated hydrocarbons (oligomers from monoterpenes, cyclopentadienes and other C5- or C9-monomeres) that are ingredients of hot-melt adhesives and can migrate into the sample mostly via gas phase transfer or via direct contact

3.6
resin oligomeric aromatic hydrocarbons
ROAH
synthetic aromatic hydrocarbons that are ingredients of hot-melt adhesives and can migrate into the sample mostly via gas phase transfer or by direct contact

3.7
poly-alpha-olefins
PAO
synthetic iso-paraffins with short and long side chains, used as lubricants or in adhesives and hotmelts

Note 1 to entry: When analysed by gas chromatography-flame ionization detection (GC-FID), they are recognized by series of rather narrow humps of unresolved branched hydrocarbons with regular distance between them.[5]

4 Principle

The sample is saponified and from the unsaponifiable residue, purified fractions are obtained following additional steps. These fractions are separated on a silica gel column of the HPLC-GC-FID system into MOSH