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Interested committees:

Title: Draft BS EN 17992 Food authenticity - Determination of the sum of 16-Omethylcafestol, 16-O-Methylkahweol and their derivatives in roasted coffee by ¹H-qNMR.

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Food authenticity - Determination of the sum of 16-O-methylcafestol, 16-O-Methylkahweol and their derivatives in roasted coffee by ^1H -qNMR

Authenticité alimentaire du café - Détermination de la teneur en 16-O-méthylcafestol - Méthode par NMR

Lebensmittelauthentizität - Bestimmung des Gehalts von 16-O-Methylcafestol, 16-O-Methylkahweol und deren Derivaten als Summenparameter in Röstkaffee mittels ^1H -qNMR

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 460.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

This document (prEN 17992:2023) has been prepared by Technical Committee CEN/TC 460 “Food authenticity”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

Introduction

This document was developed in response to demand for an efficient and reliable test method allowing the confirmation of coffee authenticity both for commercial quality control and for official food control.

The coffee species with the greatest commercial importance are *Coffea Arabica* and *Coffea canephora* var. *robusta*, commonly known as “arabica” and “robusta”. Within these species, Arabica coffees have a significantly higher market value than robusta coffees. In unblended coffee the botanical origin of coffee can be determined unambiguously by analysing the concentration of 16-O-methylcafestol and 16-O-Methylkahweol and their derivatives (e.g. fatty acid esters) because these marker substances are present in arabica coffee at very low concentrations (typically < 20 mg/kg). In robusta coffees the concentration levels are significantly higher in the approximate range of 800 to 2 500 mg/kg.¹ [1 – 5]

¹ These published values are quoted as an orientation only and not intended as strict threshold recommendations.

1 Scope

This document specifies a method for the determination of soluble 16-O-Methylcafestol and 16-O-Methylkahweol content (the sum of free forms and derivatives, e.g. fatty acid esters, henceforth abbreviated as 16-OMD = “diterpenes”) in roasted coffee (beans or ground), using quantitative proton nuclear magnetic resonance spectroscopy (^1H -qNMR).

If complying with the experimental parameters described below, this test procedure has been proven for the following concentration range:

16-OMD: 20 mg/kg to 2 000 mg/kg.

The concentration range can be expanded by suitable changes of the experimental parameters, e.g. a different weighed portion of ground coffee or the accumulation of more NMR-transients.

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.

EN ISO 1042, *Laboratory glassware - One-mark volumetric flasks (ISO 1042)*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 3509, *Coffee and coffee products — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3509 and the following 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

16-OMC and 16-OMK (= 16-O-Methyl Diterpene (“16-OMD”) derivatives content extractable with chloroform

content in coffee, determined according to this test procedure and quoted as a mass fraction w in mg per kg coffee, calculated as free 16-OMC

Note 1 to entry: An additional fraction of the total 16-OMD content (ca. 25 %) can only be extracted by vigorous chemical processing.

Note 2 to entry: Approximately a mass fraction of 90 % of the 16-OMD is represented by 16-O-methylcafestol, and 16-O-methylkahweol represent the remaining mass fraction of 10 % of the mixture.

Note 3 to entry: The relative error due to differences in molar weight is 0,6 %.

[SOURCE: [1]]

3.2

16-OMC

16-O-Methylcafestol

(CAS RN²: 108214-28-4), $M = 330,5$ g/mol

Note 1 to entry: The substance appears in its free form or esterified, see Figure 1.

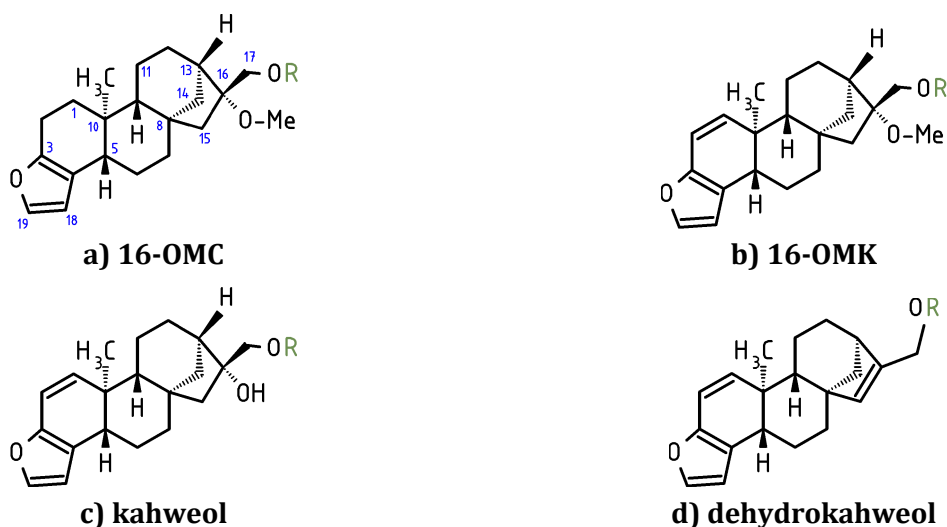
3.3

16-OMK

16-O-Methylkahweol

(CAS RN²: not yet available), $M = 328,5$ g/mol

Note 1 to entry: The substance appears in its free form or esterified, see Figure 1.



Key

R residue (H or fatty acid)

NOTE The atom numbering is the same for the shown substances.

Figure 1 — Four diterpenes present in coffee

3.4

FID

free induction decay

time-domain NMR signal that results from the precession of the nuclear magnetization vector inside the probe coil after application of an excitation RF pulse to a sample in a static magnetic field

[SOURCE: ISO 24583:2022, 3.6]

² CAS Registry Number[®] is the trademark of a product supplied by CAS. This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of the product named. Equivalent products may be used if they can be shown to lead to the same results.