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**Olive oils and olive-pomace oils —  
Determination of aliphatic and  
triterpenic alcohols content by  
capillary gas chromatography**

*Huiles d'olive et huiles de grignons d'olive — Détermination de la  
teneur en alcools aliphatiques et triterpéniques par chromatographie  
en phase gazeuse sur colonne capillaire*

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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 documents 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://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*.

This second edition cancels and replaces the first edition (ISO 12871:2010), which has been technically revised. The following change has been made: <https://standards.iteh.ai/>

— the determination of triterpenic alcohols has been introduced. <https://standards.iteh.ai/catalog/standards/sis/7c788b24-2e3b-4048-87b2-ebf039690bc2/iso-12871-2019>

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](http://www.iso.org/members.html).

# Olive oils and olive-pomace oils — Determination of aliphatic and triterpenic alcohols content by capillary gas chromatography

## 1 Scope

This document specifies a procedure for the determination of the content, as a mass fraction expressed as milligrams per kilogram, of aliphatic and triterpenic alcohols in olive oils and olive-pomace oils.

NOTE This document is based on COI/T.20/Doc. 26 Rev.2:2017<sup>[4]</sup>.

## 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 <http://www.electropedia.org/>

### 3.1

#### aliphatic alcohols content

sum of the aliphatic alcohols with carbon number C22, C24, C26, and C28, as a mass fraction, determined according to the method specified in this document

## 4 Principle

The oil, to which 1-eicosanol has been added as an internal standard, is saponified with ethanolic potassium hydroxide and the unsaponifiable matter extracted with diethyl ether. The alcoholic fraction is separated from the unsaponifiable matter by chromatography on a basic silica gel plate. The alcohols recovered from the silica gel are transformed into trimethylsilyl ethers (TMSE) and analysed by capillary gas chromatography.

## 5 Reagents

Technical, organizational and personal safety measures shall be followed.

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade, and distilled or demineralized water or water of equivalent purity.

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**5.1 Potassium hydroxide**, ethanolic solution,  $c(\text{KOH})$  approximately 2 mol/l.

Dissolve, while cooling, 130 g potassium hydroxide [ $w(\text{KOH}) = 85\%$  mass fraction minimum] in 200 ml water and make up to 1 l with ethanol. Store the solution in a well-stoppered opaque glass bottle.

**5.2 Potassium hydroxide**, ethanolic solution,  $c(\text{KOH})$  approximately 0,2 mol/l.

Dissolve 13 g potassium hydroxide in 20 ml water and make up to 1 l with ethanol.

**5.3 Diethyl ether.**

**5.4 Anhydrous sodium sulfate.**

**5.5 Glass plates**, coated with silica gel, without fluorescence indicator, 0,25 mm thick.

Suitable ready-for-use products are available commercially.

**5.6 Acetone**, chromatography grade.

**5.7 Hexane**, chromatography grade.

**5.8 Diethyl ether**, chromatography grade.

**5.9 Chloroform**, chromatography grade.

**5.10 Reference solution for thin-layer chromatography:** C20 to C28 aliphatic alcohols 0,5 g/100 ml solution in chloroform or a fraction of alcohols obtained as indicated in 9.2 from the unsaponifiable matter of an olive-pomace oil.

**5.11 2',7'-Dichlorofluorescein in ethanol**, 0,2 g/100 ml solution. Make slightly basic by adding a few drops of alcoholic potassium hydroxide solution (5.1).

**5.12 Anhydrous pyridine**, chromatography grade.

**5.13 Hexamethyldisilazane (HMDS).**

**5.14 Trimethylchlorosilane (TMCS).**

**5.15 Standard solutions of trimethylsilyl ethers (TMSE)**, of aliphatic alcohols from C20 to C28. Prepare from mixtures of pure alcohols immediately prior to use.

**5.16 Internal standard solution:** solution of 1-eicosanol in chloroform, mass concentration 0,1 g/100 ml.

**5.17 Carrier gas:** hydrogen or helium, gas chromatography grade.

**5.18 Auxiliary gas:** nitrogen, gas chromatography grade.

## 6 Apparatus

Usual laboratory equipment and, in particular, the following.

**6.1 Round-bottomed flask**, of capacity 250 ml, fitted with a reflux condenser having ground-glass joints.