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**Essential oil of oregano [*Origanum  
vulgare* L. subsp. *hirtum* (Link) letsw]**

*Huile essentielle d'origan* [*Origanum vulgare* L. subsp. *hirtum*  
(Link) letsw]

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ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
copyright@iso.org  
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 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 on 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 the following URL: [Foreword – Supplementary information](#)

The committee responsible for this document is ISO/TC 54, *Essential oils*.

# Essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw]

## 1 Scope

This International Standard specifies certain characteristics of the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw], in order to facilitate the assessment of its quality.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TS 210, *Essential oils — General rules for packaging, conditioning and storage*

ISO/TS 211, *Essential oils — General rules for labelling and marking of containers*

ISO 212, *Essential oils — Sampling*

ISO 279, *Essential oils — Determination of relative density at 20 °C — Reference method*

ISO 280, *Essential oils — Determination of refractive index*

ISO 592, *Essential oils — Determination of optical rotation*

ISO 875, *Essential oils — Evaluation of miscibility in ethanol*

ISO 11024 (all parts), *Essential oils — General guidance on chromatographic profiles*

## 3 Terms and definitions

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

### 3.1

#### **essential oil of oregano**

essential oil obtained by steam distillation of the flowering tops of *Origanum vulgare* L. subsp. *hirtum* (Link) letsw, of the Lamiaceae family, growing mainly in Germany, Netherlands and Hungary

Note 1 to entry: For information on the CAS number, see ISO/TR 21092.

## 4 Requirements

4.1 Essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw] shall meet the requirements as given in [Table 1](#).

**Table 1 — Requirements for the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw]**

Characteristics	Requirements	Test method
Appearance	Clear, mobile liquid	—
Colour	Yellow to dark brownish red	—
Odour	Characteristic, aromatic, phenolic, with a slightly spicy base	—
Relative density at 20 °C $d_{20}^{20}$	0,930 - 0,955	ISO 279
Refractive index at 20 °C	1,500 - 1,513	ISO 280
Optical rotation at 20 °C	Between -5° and +2°	ISO 592
Miscibility in ethanol, 80 % (volume fraction), at 20 °C	It shall not be necessary to use more than 2 volumes of ethanol, 80 % (volume fraction), to obtain a clear solution with 1 volume of essential oil.  Sometimes opalescence can arise on continuing the addition of ethanol.	ISO 875

**4.2** Carry out the analysis of the essential oil by gas chromatography. Determine the chromatographic profile in accordance with ISO 11024 (all parts). Identify in the chromatogram obtained, the representative and characteristic components shown in [Table 2](#). The proportions of these components, indicated by the integrator, shall be as shown in [Table 2](#). This constitutes the chromatographic profile of the essential oil.

**Table 2 — Chromatographic profile**

Component	Minimum %	Maximum %
$\alpha$ -Thujene	0,2	1,5
$\alpha$ -Pinene	0,2	2,5
Myrcene	0,5	3,0
$\alpha$ -Terpinene	0,5	2,0
<i>p</i> -Cymene	4,0	10,0
$\gamma$ -Terpinene	3,0	9,0
Linalool	traces <sup>a</sup>	3,0
Terpinen-4-ol	0,5	2,0
Thymol	0,5	5,0
Carvacrol	60,0	80,0
$\beta$ -Caryophyllene	0,5	4,0

<sup>a</sup> traces: < 0,01 %.

NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in [Annex A](#).

## 5 Flash point

Information on the flash point is given in [Annex B](#).

## 6 Sampling

Sampling shall be performed in accordance with ISO 212.

Minimum volume of test sample: 25 ml.

NOTE This volume allows each of the tests specified in this International Standard to be carried out at least once.

## **7 Packaging, labelling, marking and storage**

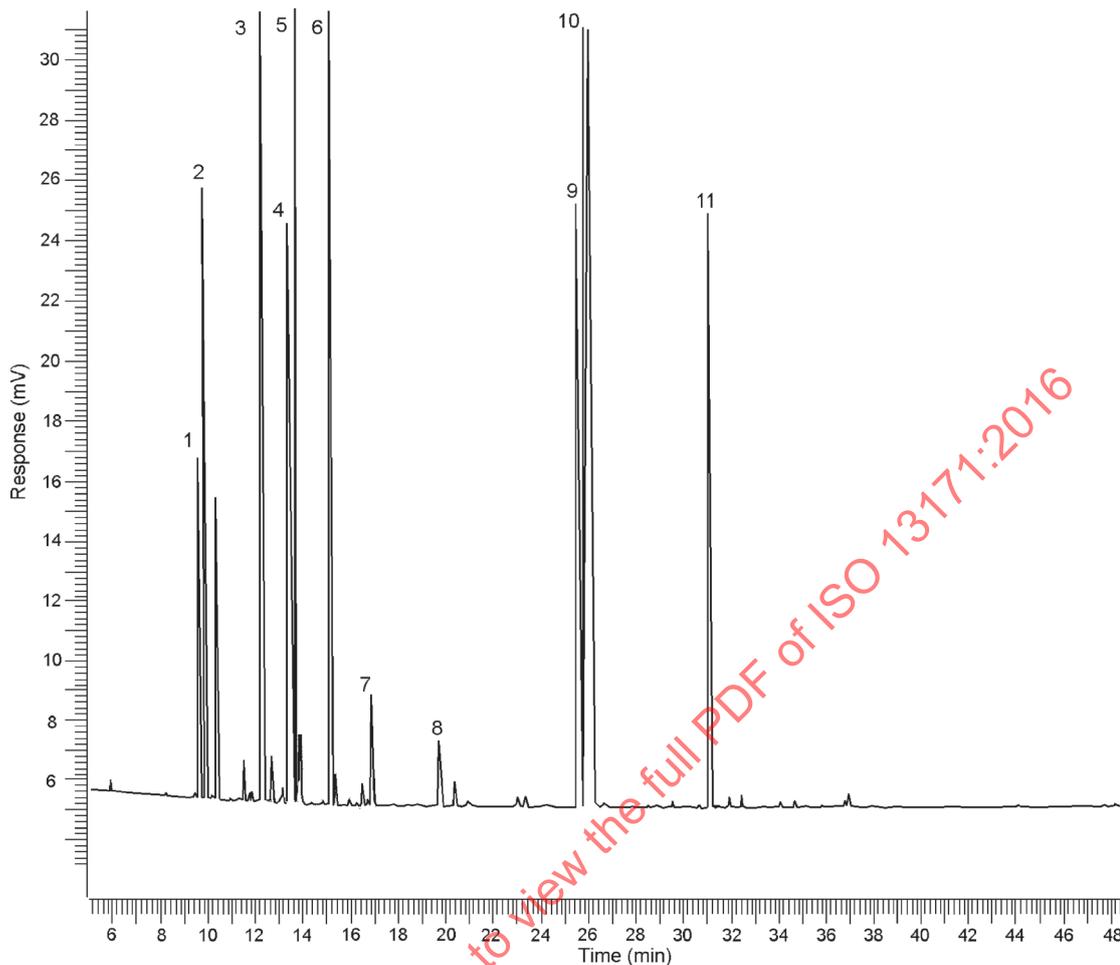
These items shall be in accordance with ISO/TS 210 and ISO/TS 211.

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**Annex A**  
(informative)

**Typical chromatograms of the analysis by gas chromatography of  
the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum*  
(Link) letsw]**

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**Peak identification**

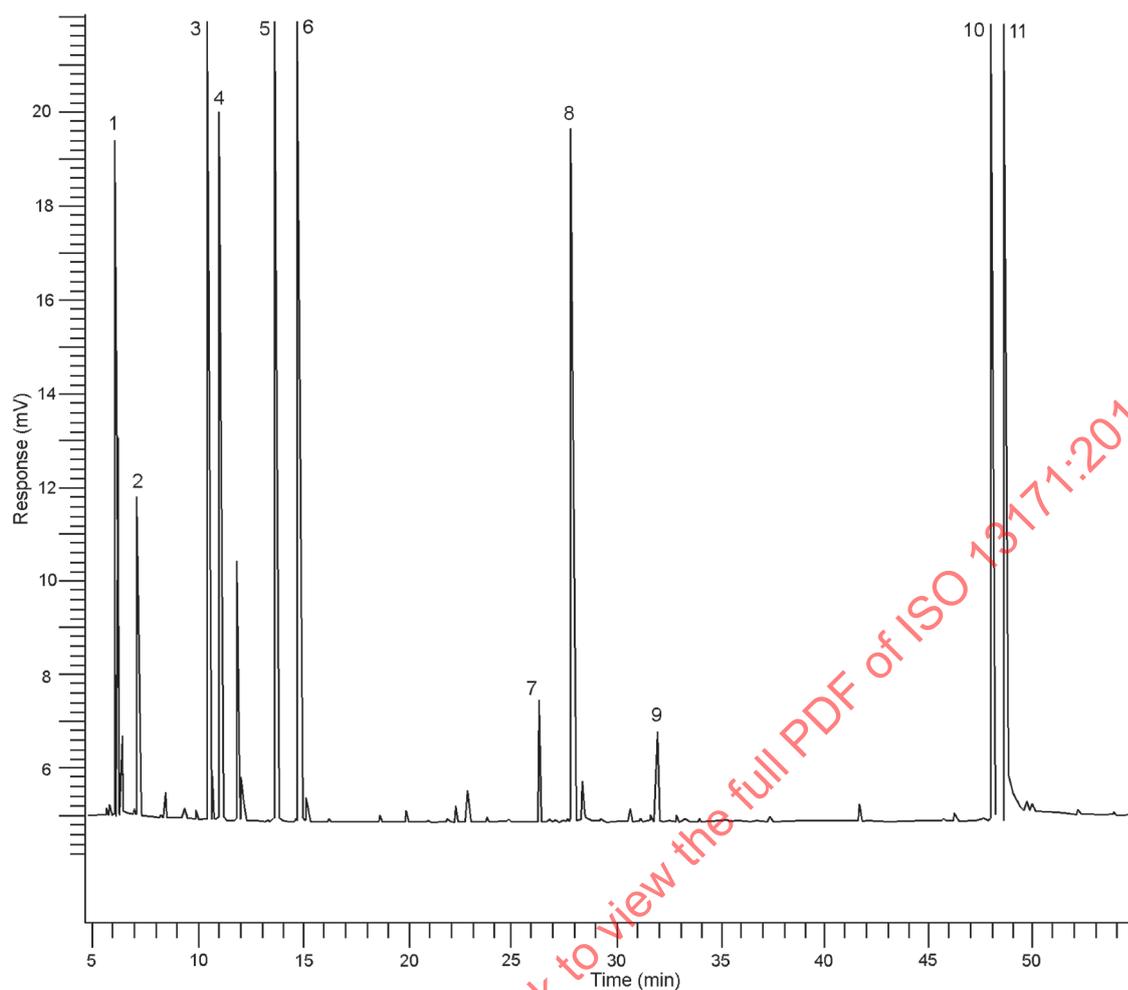
- |    |                        |
|----|------------------------|
| 1  | $\alpha$ -Thujene      |
| 2  | $\alpha$ -Pinene       |
| 3  | Myrcene                |
| 4  | $\alpha$ -Terpinene    |
| 5  | <i>p</i> -Cymene       |
| 6  | $\gamma$ -Terpinene    |
| 7  | Linalool               |
| 8  | Terpinen-4-ol          |
| 9  | Thymol                 |
| 10 | Carvacrol              |
| 11 | $\beta$ -Caryophyllene |

**Operating conditions**

- |  |
|--|
| Column: fused capillary silica, 30 m length, 0,25 mm internal diameter   |
| Stationary phase: SPB™ -1 (SE-30) <sup>a</sup>   |
| Film thickness: 0,25 $\mu$ m   |
| Oven temperature: programming temperature from 50 °C to 180 °C at a rate of 3 °C/min and 180 °C to 220 °C at a rate of 10 °C/min |
| Injector temperature: 260 °C   |
| Detector temperature: 280 °C   |
| Detector: flame ionization type  |
| Carrier gas: helium  |
| Volume injected: 1 $\mu$ l   |
| Carrier gas flow rate: 1 ml/min  |
| Split ratio: 1/50  |

<sup>a</sup> SPB™ -1 (SE-30) is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product

**Figure A.1 — Typical chromatogram taken on an apolar column**

**Peak identification**

- 1  $\alpha$ -Pinene
- 2  $\alpha$ -Thujene
- 3 Myrcene
- 4  $\alpha$ -Terpinene
- 5 *p*-Cymene
- 6  $\gamma$ -Terpinene
- 7 Linalool
- 8  $\beta$ -Caryophyllene
- 9 Terpinen-4-ol
- 10 Thymol
- 11 Carvacrol

**Operating conditions**

Column: fused capillary silica, 30 m length, 0,25 mm internal diameter  
 Stationary phase: Supelco Wax™ -10<sup>a</sup>  
 Film thickness: 0,25  $\mu$ m  
 Oven temperature: programming temperature from 50 °C to 180 °C at a rate of 3 °C/min and 180 °C to 220 °C at a rate of 10 °C/min  
 Injector temperature: 260 °C  
 Detector temperature: 280 °C  
 Detector: flame ionization type  
 Carrier gas: helium  
 Volume injected: 1  $\mu$ l  
 Carrier gas flow rate: 1 ml/min  
 Split ratio: 1/50

<sup>a</sup> Supelco Wax™ -10 is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product

**Figure A.2 — Typical chromatogram taken on a polar column**

## Annex B (informative)

### Flashpoint

#### B.1 General information

For safety reasons, transport companies, insurance companies, and people in charge of safety services require information on the flash points of essential oils, which in most cases are flammable products.

A comparative study on the relevant methods of analysis (see ISO/TR 11018) concluded that it was difficult to recommend a single apparatus for standardization purposes, given that:

- there is a wide variation in the chemical composition of essential oils;
- the volume of the sample needed in certain requirements would be too costly for high priced essential oils;
- as there are several different types of equipment which can be used for the determination, users cannot be expected to use one specified type only.

Consequently, it was decided to give a mean value for the flashpoint annexed to each International Standard, for information, in order to meet the requirements of the interested parties.

The equipment with which this value was obtained shall be specified.

For further information see ISO/TR 11018.

#### B.2 Flashpoint of the essential oil of oregano [*Origanum vulgare* L. subsp. *hirtum* (Link) letsw]

The mean value is +65 °C.

NOTE Obtained with "closed cup"<sup>1)</sup> equipment.

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1) Equipment available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product.