
**Essential oil of thyme [*Thymus vulgaris* L. and *Thymus zygis* L.],
thymol type**

*Huile essentielle de thym [Thymus vulgaris L. et Thymus zygis L.],
type thymol*

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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

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definition	1
4 Requirements	1
4.1 General requirements	1
4.2 Chromatographic profile	2
5 Flashpoint	2
6 Sampling	2
7 Packaging, labelling, marking and storage	3
Annex A (informative) Typical chromatograms of the analysis by gas chromatography of the essential oil of thyme [<i>Thymus vulgaris</i> L. and <i>Thymus zygis</i> L.], thymol type	4
Annex B (informative) Flashpoint	6
Bibliography	7

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 54, *Essential oils*.

Essential oil of thyme [*Thymus vulgaris* L. and *Thymus zygis* L.], thymol type

1 Scope

This document specifies characteristics of the essential oil of thyme [*Thymus vulgaris* L. and *Thymus zygis* L.], thymol type, in order to facilitate the assessment of its quality.

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/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 definition

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

essential oil of thyme, thymol type

essential oil obtained by steam distillation of the flowering tops of *Thymus vulgaris* L., of the Lamiaceae family, grown mainly in Germany, Hungary and Poland, and *Thymus zygis* L., of the Lamiaceae family, grown mainly in Spain and Portugal

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

4 Requirements

4.1 General requirements

Essential oil of thyme, thymol type shall meet the requirements as given in [Table 1](#).

Table 1 — Requirements for the essential oil of thyme, thymol type

Characteristics	Requirements	Test method
Appearance	Mobile liquid	—
Colour	Yellow to red	—
Odour	Aromatic, phenolic with a slightly spice base	—
Relative density at 20 °C, d_{20}^{20}	0,910–0,937	ISO 279
Refractive index at 20 °C	1,494–1,504	ISO 280
Optical rotation	Between -6° and 0°	ISO 592
Miscibility in ethanol 80 % (volume fraction), at 20 °C	It shall not be necessary to use more than three volumes of ethanol 80 % (volume fraction) to obtain a clear solution with one volume of essential oil. Sometimes opalescence can arise on continuing the addition of ethanol.	ISO 875

4.2 Chromatographic profile

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 %
α -Thujene	0,5	1,5
α -Pinene	0,5	2,5
β -Myrcene	1,0	2,8
α -Terpinene	0,9	2,6
γ -Terpinene	4,0	13,0
<i>p</i> -Cymene	14,0	28,0
Linalool	0,5	6,5
Terpinen-4-ol	0,1	2,5
Thymol	35,0	55,0
Carvacrol	0,5	5,5
β -Caryophyllene	0,5	4,0
<i>trans</i> -Sabinene hydrate	traces ^a	0,5
Carvacrol methyl ether	0,1	1,5

NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A, see Figures A.1 and A.2.

^a < 0,01 %.

5 Flashpoint

Information on the flashpoint is given in Annex B.

6 Sampling

Sampling shall be performed in accordance with ISO 212.

The minimum volume of the test sample is 25 ml.

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

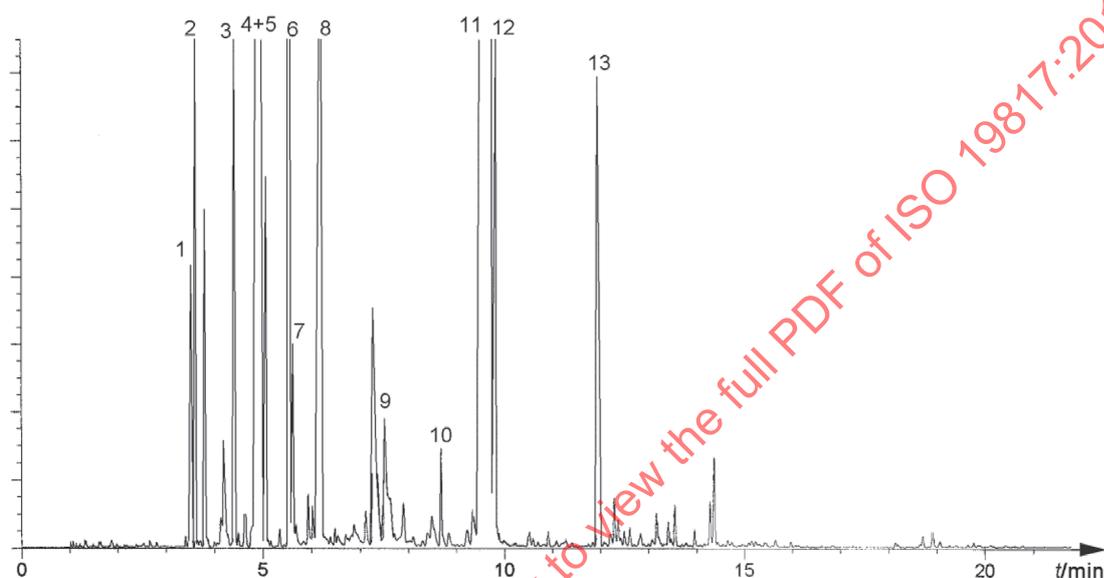
7 Packaging, labelling, marking and storage

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 thyme [*Thymus vulgaris* L. and *Thymus zygis* L.], thymol type



Key

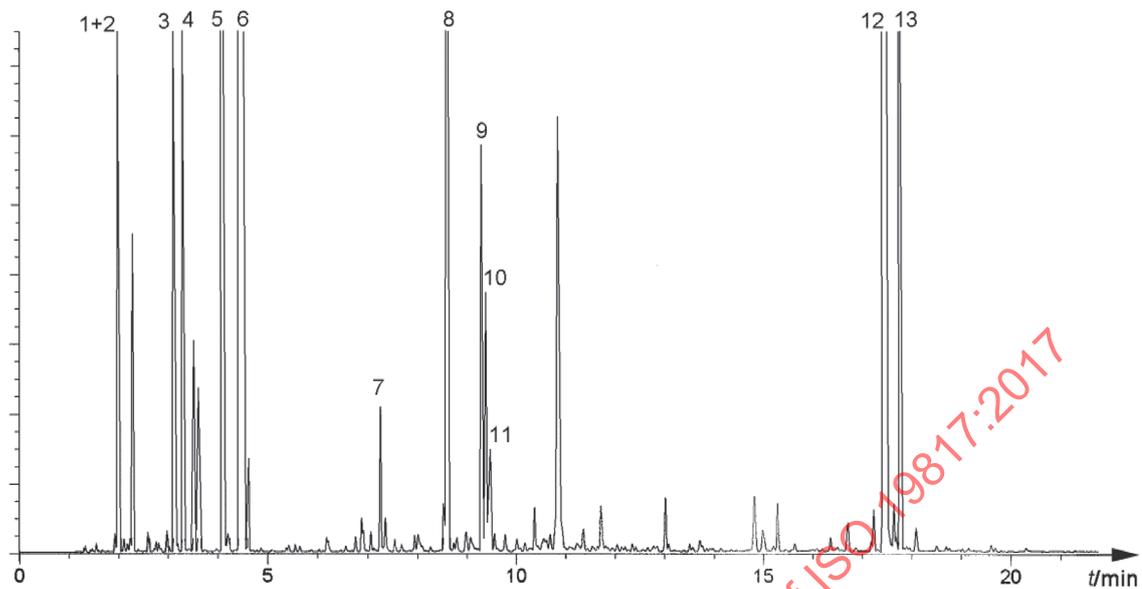
Peak identification

- 1 α -Thujene
- 2 α -Pinene
- 3 β -Myrcene
- 4 α -Terpinene
- 5 *p*-Cymene
- 6 γ -Terpinene
- 7 *trans*-Sabinene hydrate
- 8 Linalool
- 9 Terpinen-4-ol
- 10 Carvacrol methyl ether
- 11 Thymol
- 12 Carvacrol
- 13 β -Caryophyllene

Operating conditions

- Column: capillary, fused silica, length 50 m, internal diameter 0,30 mm
 Stationary phase: poly(methylsiloxane)
 Film thickness: 0,25 μ m
 Oven temperature: temperature programming from 65 $^{\circ}$ C to 220 $^{\circ}$ C at a rate of 2 $^{\circ}$ C/min
 Injector temperature: 230 $^{\circ}$ C
 Detector temperature: 250 $^{\circ}$ C
 Detector: flame ionization type
 Carrier gas: hydrogen
 Volume injected: 0,2 μ l
 Carrier gas flow rate: 0,35 m/s approx.
 Split ratio: 1:100
t: time

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

**Key****Peak identification**

- 1 α -Thujene
- 2 α -Pinene
- 3 Myrcene
- 4 α -Terpinene
- 5 γ -Terpinene
- 6 *p*-Cymene
- 7 *trans*-Sabinene hydrate
- 8 Linalool
- 9 β -Caryophyllene
- 10 Terpinen-4-ol
- 11 Carvacrol methyl ether
- 12 Thymol
- 13 Carvacrol

Operating conditions

Column: capillary, fused silica, length 25 m, internal diameter 0,20 mm
 Stationary phase: polyethylene glycol [SP-20 000^a]
 Film thickness: 0,25 μ m
 Oven temperature: temperature programming from 65 °C to 200 °C at a rate of 5 °C/min
 Injector temperature: 240 °C
 Detector temperature: 250 °C
 Detector: flame ionization type
 Carrier gas: hydrogen
 Volume injected: 0,2 μ l
 Carrier gas flow rate: 0,35 m/s approx.
 Split ratio: 1:100
t: time

^a SP-20 000 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