

INTERNATIONAL STANDARD

ISO 14715

First edition
1999-10-01

Oil of thyme containing thymol, Spanish type [*Thymus zygis* (Loefl.) L.]

Huile essentielle de thym à thymol, type Espagne [Thymus zygis (Loefl.) L.]

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ISO 14715:1999

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Reference number
ISO 14715:1999(E)

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 14715 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

Annexes A and B of this International Standard are for information only.

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Oil of thyme containing thymol, Spanish type [*Thymus zygis* (Loefl.) L.]

1 Scope

This International Standard specifies certain characteristics of the oil of thyme containing thymol, Spanish type [*Thymus zygis* (Loefl.) L.], in order to facilitate assessment of its quality.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO/TR 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 1272, *Essential oils — Determination of phenols content.*

ISO 11024-1, *Essential oils — General guidance on chromatographic profiles — Part 1: Preparation of chromatographic profiles for presentation in standards.*

ISO 11024-2, *Essential oils — General guidance on chromatographic profiles — Part 2: Utilization of chromatographic profiles of samples of essential oils.*

3 Term and definition

For the purposes of this International Standard, the following term and definition apply.

3.1

oil of thyme containing thymol, Spanish type

essential oil obtained by steam distillation of the flowering tops of *Thymus zygis* (Loefl.) L., of the Lamiaceae family, growing mainly in Spain

4 Requirements

4.1 Appearance

Clear, mobile liquid.

4.2 Colour

Traditionally from reddish brown to very intense brown (almost black).

NOTE The essential oil obtained by distillation in a stainless-steel kettle has a much lighter colour. The distillation of red thyme leads to the so-called white thyme with similar characteristics.

4.3 Odour

Characteristic, aromatic, phenolic (thymol), with a slightly spicy base.

4.4 Relative density at 20 °C, d_{20}^{20}

Minimum: 0,910
Maximum: 0,937

4.5 Refractive index at 20 °C

Minimum: 1,494 0
Maximum: 1,504 0

4.6 Optical rotation at 20 °C

Between -1° and -6° .

NOTE Generally laevorotatory; frequently impossible to measure due to its colour.

4.7 Miscibility in ethanol, 80 % volume fraction, at 20 °C

It shall not be necessary to use more than 3 volumes of 80 % ethanol to obtain a clear solution with 1 volume of essential oil.

4.8 Total phenols content

Minimum volume fraction: 38 %
Maximum volume fraction: 56 %

4.9 Chromatographic profile

Analysis of the essential oil shall be carried out by gas chromatography. In the chromatogram obtained, the representative and characteristic components shown in Table 1 shall be identified. The proportions of these components, indicated by the integrator, shall be as shown in Table 1. This constitutes the chromatographic profile of the essential oil.

Table 1 — Chromatographic profile

Component	Minimum %	Maximum %
α -Thujene	0,2	1,5
α -Pinene	0,5	2,5
Myrcene	1	2,8
α -Terpinene	0,9	2,6
γ -Terpinene	4	11
<i>p</i> -Cymene	14	28
<i>trans</i> -Sabinene hydrate	tr	0,5
Linalool	3	6,5
Terpinen-4-ol	0,1	2,5
Methyl ether of carvacrol	0,1	1,5
Thymol	37	55
Carvacrol	0,5	5,5
β -Caryophyllene	0,5	2

NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in annex A.

4.10 Flashpoint

Information on the flashpoint is given in annex B.

5 Sampling

See 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.

6 Test methods

6.1 Relative density at 20 °C, d_{20}^{20}

See ISO 279.

6.2 Refractive index at 20 °C

See ISO 280.

6.3 Optical rotation at 20 °C

See ISO 592.

6.4 Miscibility in ethanol, 80 % volume fraction, at 20 °C

See ISO 875.

6.5 Phenols content

See ISO 1272.

Stir for 6 h using a magnetic stirrer.

6.6 Chromatographic profile

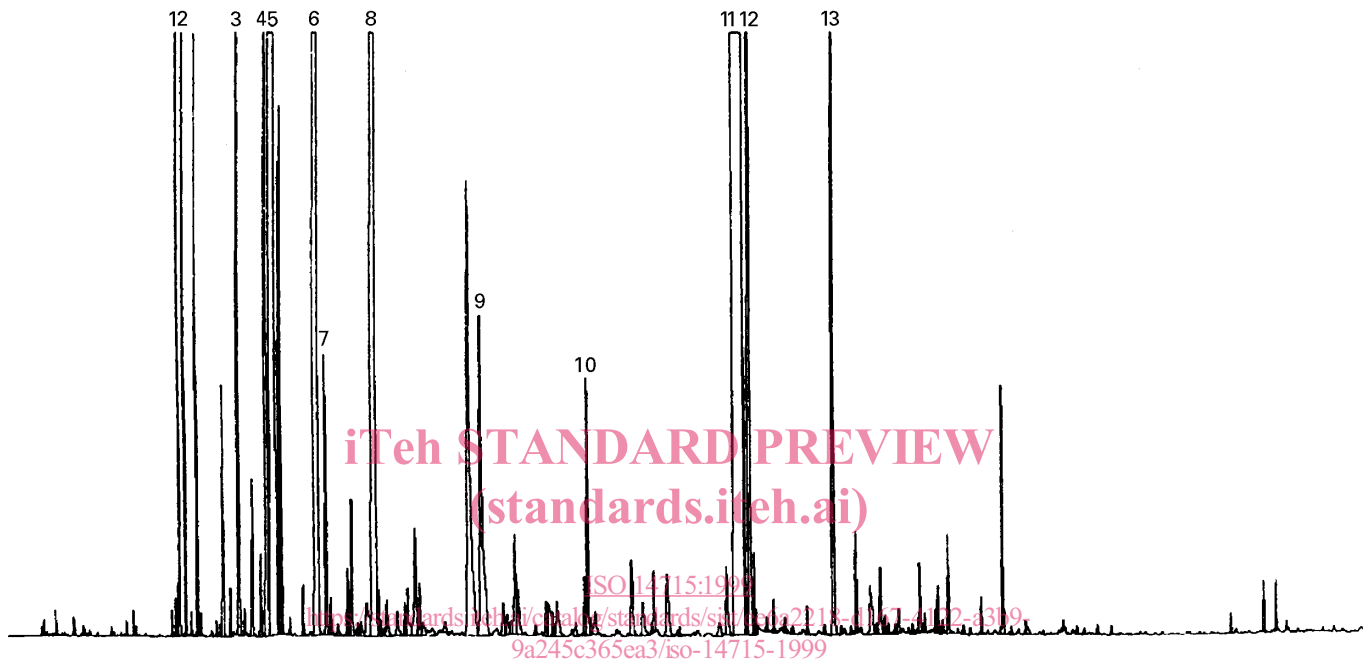
See ISO 11024-1 and ISO 11024-2.

7 Packaging, labelling, marking and storage

See ISO/TR 210 and ISO/TR 211.

Annex A (informative)

Typical chromatograms of the analysis by gas chromatography of the oil of thyme containing thymol, Spanish type [*Thymus zygis* (Loefl.) L.]



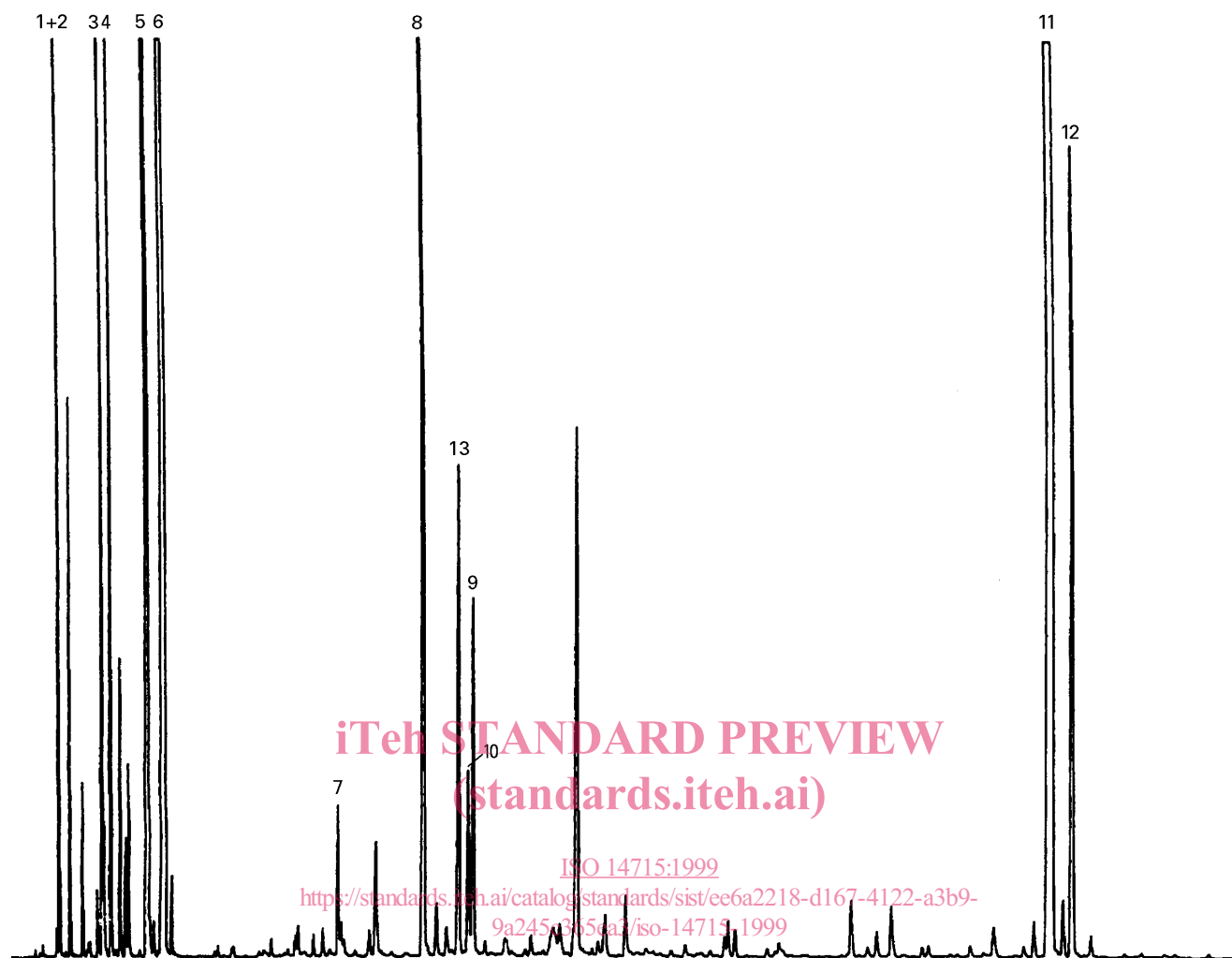
Peak identification

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

Operating conditions

Column: fused silica capillary; length 50 m; internal diameter 0,20 mm
 Stationary phase: polydimethylsiloxane
 Film thickness: 0,25 μ m
 Oven temperature: temperature programming from 65 °C to 220 °C at 2 °C/min
 Injector temperature: 230 °C
 Detector temperature: 250 °C
 Detector: flame ionization type
 Carrier gas: hydrogen
 Volume injected: 0,2 μ l
 Linear velocity of carrier gas: 0,35 m/s approx.
 Split ratio: 1/100

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

**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 Terpinen-4-ol
- 10 Methyl ether of carvacrol
- 11 Thymol
- 12 Carvacrol
- 13 β -Caryophyllene

Operating conditions

Column: fused silica capillary; length 25 m; internal diameter 0,20 mm
 Stationary phase: polyethyleneglycol 20 000
 Film thickness: 0,25 μ m
 Oven temperature: temperature programming from 65 °C to 200 °C at 5 °C/min
 Injector temperature: 240 °C
 Detector temperature: 250 °C
 Detector: flame ionization type
 Carrier gas: hydrogen
 Volume injected: 0,2 μ l
 Linear velocity of carrier gas: 0,35 m/s approx.
 Split ratio: 1/100

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

Annex B (informative)

Flashpoint

B.1 General information

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

A comparative study on the relevant methods of analysis (see ISO/TR 11018¹⁾) concluded that it was hard to find a single method for standardization purposes, given that:

- essential oils are varied and their chemical compositions differ to a large extent;
- the volume of the sample needed for certain test equipment is incompatible with the high price of essential oils;
- there are different types of equipment that satisfy the desired objective, but users cannot be obliged to use one type of equipment rather than another.

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

If possible, the method by which this value was obtained should be specified.

For further information see ISO/TR 11018¹⁾.

B.2 Flashpoint of essential oil of thyme containing thymol, Spanish type

The mean value is +60 °C.

NOTE Obtained with "Setaflash" equipment.

1) ISO/TR 11018, *Essential oils — General guidance on the determination of flashpoint.*

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