INTERNATIONAL STANDARD

ISO 1342

Second edition
2000-11-01

Oil of rosemary (*Rosmarinus officinalis* L.)

*Huile essentielle de romarin (*Rosmarinus officinalis *L.)*

Reference number
ISO 1342:2000(E)

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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.

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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 1342 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 1342:1988), which has been technically revised.

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

Oil of rosemary (*Rosmarinus officinalis* L.)

1 Scope

This International Standard specifies certain characteristics of oil of rosemary (*Rosmarinus officinalis* 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 standards 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 709, *Essential oils — Determination of ester value.*

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

ISO 1242, *Essential oils — Determination of acid value.*

ISO 3794, *Essential oils (containing tertiary alcohols) — Estimation of free alcohols content by determination of ester value after acetylation*.

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 applies.

3.1
oil of rosemary
essential oil obtained by steam distillation of the twigs and blossoming tips of *Rosmarinus officinalis* L. of the Lamiaceae family

NOTE CAS number of oil of rosemary: 84604-14-8.

4 Requirements

4.1 Appearance

Clear mobile liquid.

4.2 Colour

Colourless to pale yellow or greenish yellow.

4.3 Odour

Characteristic, balsamic, cineole-like, more or less camphoraceous.

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

	Tunisian and Moroccan type	Spanish type
Minimum:	0,907	0,892
Maximum:	0,920	0,910

4.5 Refractive index at 20 °C

	Tunisian and Moroccan type	Spanish type
Minimum:	1,464 0	1,464 0
Maximum:	1,470 0	1,472 0

4.6 Optical rotation at 20 °C

	Tunisian and Moroccan type	Spanish type
Between	– 2° and + 5°	– 5° and + 8°

4.7 Miscibility in ethanol at 20 °C

Tunisian and Moroccan type

It shall not be necessary to use more than 2 volumes of 80 % (volume fraction) ethanol to obtain a clear solution with 1 volume of essential oil.

Spanish type

It shall not be necessary to use more than 3 volumes of 90 % (volume fraction) ethanol to obtain a clear solution with 1 volume of essential oil.

4.8 Acid value

	Tunisian and Moroccan type	Spanish type
Maximum:	1,0	1,0

4.9 Ester value

	Tunisian and Moroccan type	Spanish type
Minimum:	2	2
Maximum:	15	15

4.10 Ester value after acetylation

	Tunisian and Moroccan type	Spanish type
Minimum:	30	30
Maximum:	72	55

4.11 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.

4.12 Flashpoint

Information on the flashpoint is given in annex B.

5 Sampling

See ISO 212.

Minimum volume of test sample: 50 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.

Table 1 — Chromatographic profile

Component	Tunisian and Moroccan type		Spanish type	
	min.	max.	min.	max.
	%	%	%	%
α-Pinene	9	14	18	26
Camphene	2,5	6	8	13
β-Pinene	4	9	2	5
Myrcene	1	2	2,5	4,5
Limonene	1,5	4	2,5	5,5
1,8-Cineole	38	55	17	25
p-Cymene	0,5	2,5	1	2
Camphor	5	15	12,5	22
Bornyl acetate	0,1	1,6	0,4	2,5
α-Terpineol	1	2,5	1	3,5
Borneol	1	5	2	4,5
Verbenone	n.d.[a]	0,4	0,7	2,5
[a] n.d.= not detectable				
NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in annex A.				

6.3 Optical rotation at 20 °C

See ISO 592.

6.4 Miscibility in ethanol at 20 °C

See ISO 875.

6.5 Acid value

See ISO 1242.

6.6 Ester value

See ISO 709.

Test sample: 2 g.

Saponification time: 30 min.

6.7 Ester value after acetylation

See ISO 3794.

Test sample: 2 g.

Saponification time: 1 h.

Acetylation time: 16 h.

6.8 Chromatographic profile

See ISO 11024-1 and ISO 11024-2.

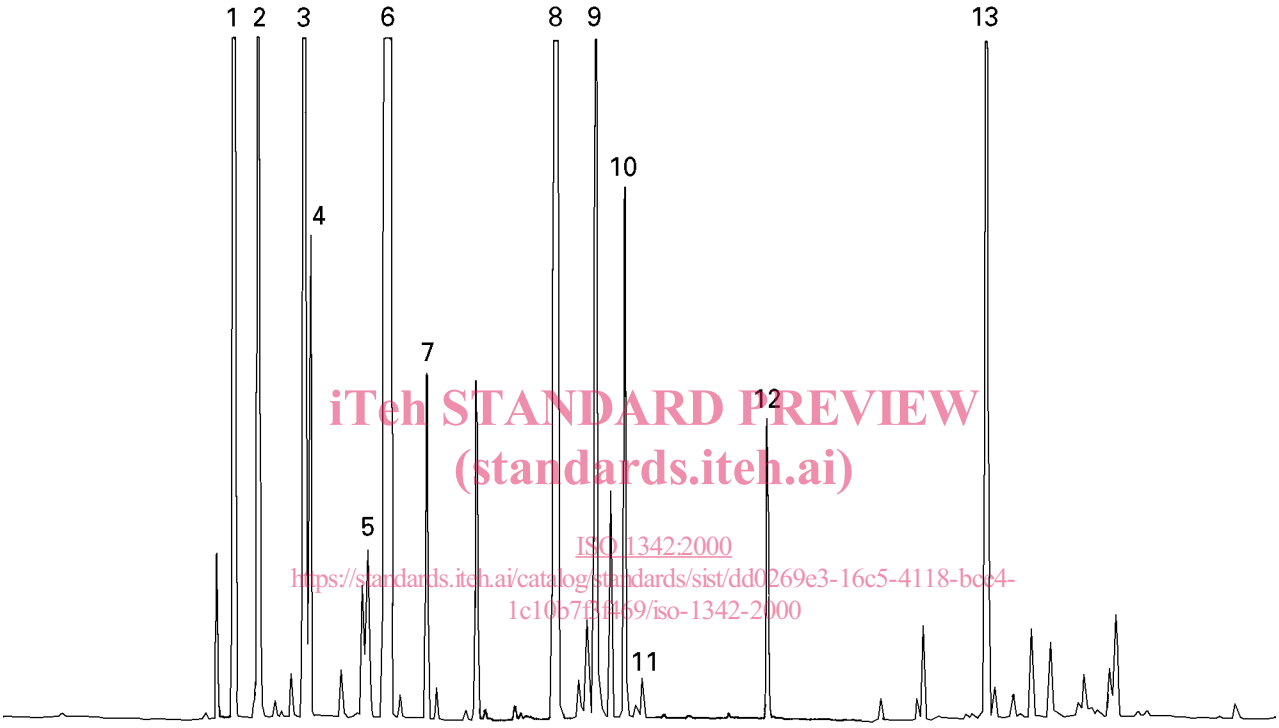
7 Packaging, labelling, marking and storage

See ISO/TR 210 and ISO/TR 211.

Annex A
(informative)

Typical chromatograms of the analysis by gas chromatography of the essential oils of rosemary (*Rosmarinus officinalis* L.)

A.1 Essential oil of rosemary, Tunisian and Moroccan type



Peak identification

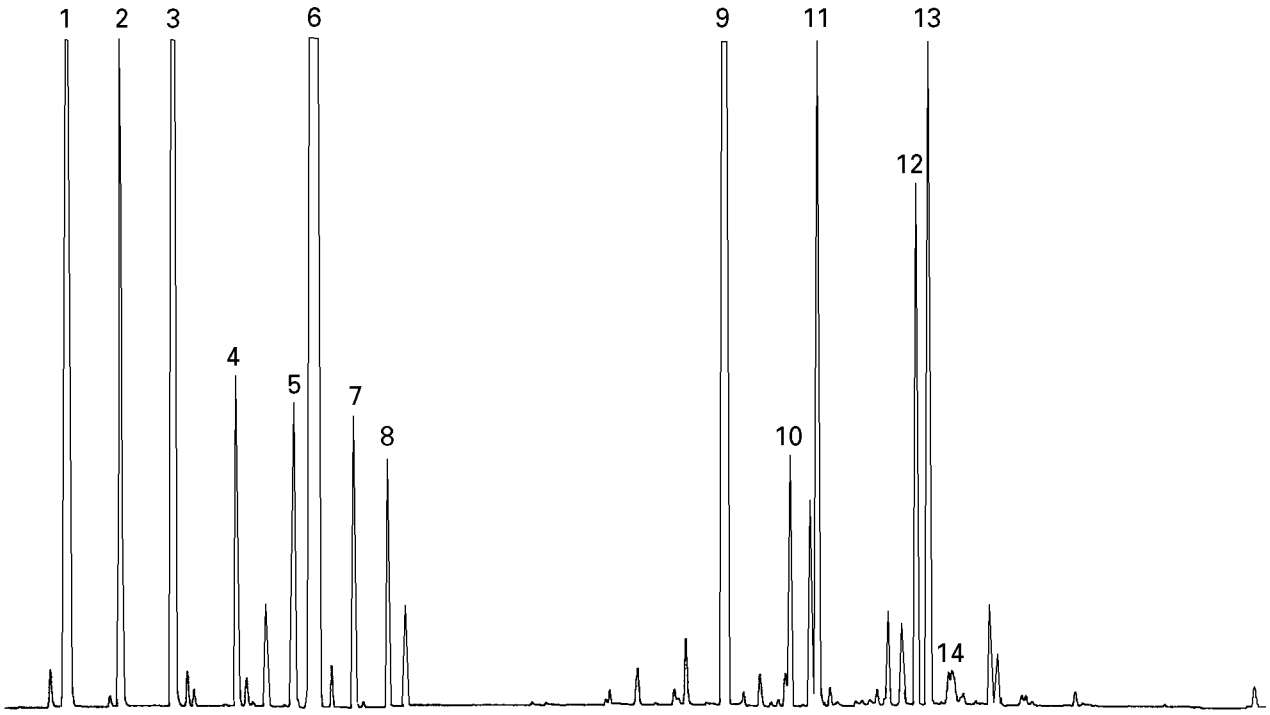
1 α-Pinene
2 Camphene
3 β-Pinene
4 Myrcene
5 *p*-Cymene
6 Limonene+1,8-cineole
7 γ-Terpinene
8 Camphor
9 Borneol
10 α-Terpineol
11 Verbenone
12 Bornyl acetate
13 β-Caryophyllene

Operating conditions

Column: capillary, fused silica; length 20 m; internal diameter 0,1 mm
Stationary phase: HP-1
Film thickness: 0,40 μm
Oven temperature: 50 °C for 1 min, then programmed from 50 °C to 220 °C at a rate of 10 °C/min, then 220 °C for 13 min
Injector temperature: 250 °C
Detector temperature: 250 °C
Detector: flame ionization type
Carrier gas: hydrogen
Volume injected: 0,2 μl
Carrier gas flow rate: 0,3 ml/min
Split ratio: 1/350
Pressure programming: starting at 220,7 kPa[1)] for 20 min, then 34,5 kPa/min up to 310,3 kPa, then 310,3 kPa for 20 min

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

1) 1 kPa = 0,145 psi



Peak identification

1 α-Pinene
2 Camphene
3 β-Pinene
4 Myrcene
5 Limonene
6 1,8-Cineole
7 γ-Terpinene
8 *p*-Cymene
9 Camphor
10 Bornyl acetate
11 β-Caryophyllene
12 α-Terpineol
13 Borneol
14 Verbenone

Operating conditions

Column: capillary, fused silica, length 20 m, internal diameter 0,1 mm

Stationary phase: polyethylene glycol 20 000

Film thickness: 0,20 μm

Oven temperature: 50 °C for 1 min, then programmed from 50 °C to 200 °C at a rate of 10 °C/min

Injector temperature: 250 °C

Detector temperature: 250 °C

Detector: flame ionization type

Carrier gas: hydrogen

Volume injected: 0,2 μl

Carrier gas flow rate: 0,3 ml/min

Split ratio: 1/350

Pressure programming: starting at 220,7 kPa[1)] for 20 min, then 34,5 kPa/min up to 310,3 kPa, then 310,3 kPa for 20 min

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