INTERNATIONAL STANDARD

ISO 9909

First edition
1997-05-01

Oil of Dalmatian sage (*Salvia officinalis* L.)

Huile essentielle de sauge officinale (Salvia officinalis *L.*)

Reference number
ISO 9909:1997(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.

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 9909 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 Dalmatian sage (*Salvia officinalis* L.)

1 Scope

This International Standard specifies certain characteristics of the oil of Dalmatian sage (*Salvia officinalis* L.), in order to facilitate assessment of its quality.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and 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. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 210:—[1], *Essential oils — General rules for packaging, conditioning and storage.*

ISO 211:—[2], *Essential oils — General rules for labelling and marking of containers.*

ISO 212:1973, *Essential oils — Sampling.*

ISO 279:1981, *Essential oils — Determination of relative density at 20 °C (Reference method).*

ISO 280:1976, *Essential oils — Determination of refractive index.*

ISO 592:1981, *Essential oils — Determination of optical rotation.*

ISO 875:1981, *Essential oils — Evaluation of miscibility in ethanol.*

ISO 1279:1984, *Essential oils — Determination of carbonyl value — Hydroxylammonium chloride method.*

ISO 11024-1:—[3], *Essential oils — General guidance on chromatographic profiles — Part 1: Preparation of chromatographic profiles for presentation in standards.*

ISO 11024-2:—[3], *Essential oils — General guidance on chromatographic profiles — Part 2: Utilization of chromatographic profiles of a sample of essential oils.*

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 oil of Dalmatian sage: Essential oil obtained by steam distillation of the leaves of *Salvia officinalis* L. of the Lamiaceae family.

1) To be published. (Revision of ISO 210:1961)

2) To be published. (Revision of ISO 211:1961)

3) To be published.

4 Requirements

4.1 Appearance

Liquid.

4.2 Colour

Colourless to yellow.

4.3 Odour

Characteristic, camphoraceous, with a spicy note.

4.4 Taste

Sharp and bitter.

4.5 Relative density at 20 °C/20 °C

Minimum: 0,910
Maximum: 0,930

4.6 Refractive index at 20 °C

Minimum: 1,458 0
Maximum: 1,474 0

4.7 Optical rotation at 20 °C

Range from +2° to +30°

4.8 Miscibility with 70 % (*V/V*) ethanol at 20 °C

The miscibility with ethanol shall be such that 1 volume of the oil shall not require more than 2 volumes of 70 % (*V/V*) ethanol, at 20 °C, to give a clear solution. Opalescence may be observed on further addition of solvent.

4.9 Miscibility with 80 % (*V/V*) ethanol at 20 °C

The miscibility with ethanol shall be such that 1 volume of the oil shall not require more than 2 volumes of 80 % (*V/V*) ethanol, at 20 °C, to give a clear solution.

4.10 Carbonyl value

Minimum: 103, corresponding to 28 % (*m/m*) of carbonyl compounds expressed as thujone.

Maximum: 288, corresponding to 78 % (*m/m*) of carbonyl compounds expressed as thujone.

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.

Table 1 — Chromatographic profile

Component	Minimum %	Maximum %
α-Pinene	1	6,5
Camphene	1,5	7
Limonene	0,5	3
1,8-Cineole	5,5	13
α-Thujone	18	43
β-Thujone	3	8,5
Camphor	4,5	24,5
Linalol + linalyl acetate	—	1
Bornyl acetate	—	2,5
α-Humulene	—	12
NOTE — The chromatographic profile is normative, contrary to typical chromatogram given for information in annex A.		

4.12 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/20 °C

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 with 70 % (*V/V*) or 80 % (*V/V*) ethanol at 20 °C

See ISO 875.

6.5 Carbonyl value

See ISO 1279.

Test sample: 1 g.
Heating time in boiling water bath: 2 h.
Relative molecular mass of thujone: M_r = 152,23

6.6 Chromatographic profile

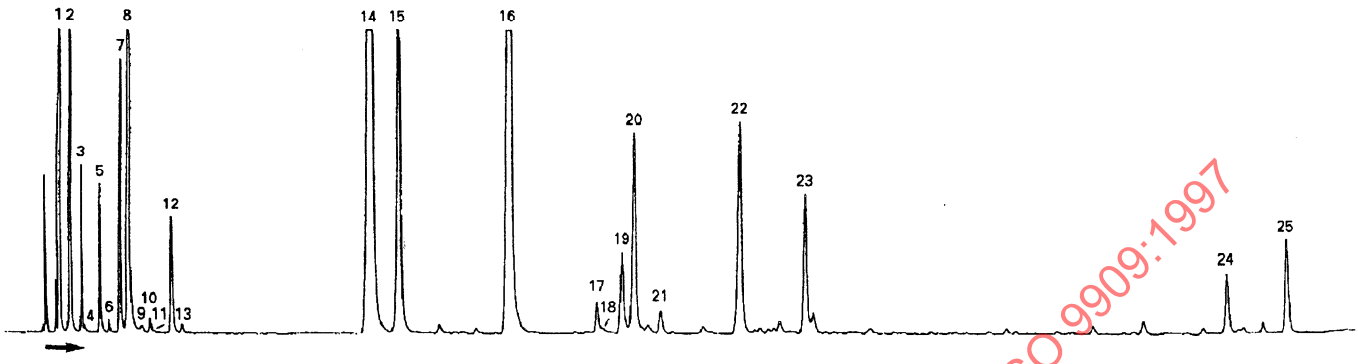
See ISO 11024-1 and ISO 11024-2.

7 Packaging, labelling, marking and storage

See ISO 210 and ISO 211.

Annex A
(informative)

Typical chromatogram of the essential oil of Dalmatian sage



Operating conditions

Column: fused silica capillary; length 50 m; diameter 0,32 mm
Stationary phase: polyethylene glycol 20 000
Oven temperature: 70 °C for 15 min; then from 70 °C to 180 °C at a rate of 2 °C/min; then 180 °C for 10 min
Injector temperature: 180 °C to 200 °C
Detector temperature: 200 °C to 220 °C
Detector: flame ionization
Carrier gas: helium
Volume injected: about 0,1 µl

Peak identification

1 α-Pinene
2 Camphene
3 β-Pinene
4 Sabinene
5 Myrcene
6 α-Terpinene
7 Limonene
8 1,8-Cineole
9 *cis*-Ocimene
10 γ-Terpinene
11 *trans*-Ocimene
12 *p*-Cymene
13 Terpinolene
14 α-Thujone
15 β-Thujone
16 Camphor
17 Linalol
18 Linalyl acetate
19 Bornyl acetate
20 β-Caryophyllene
21 Terpinen-1-ol
22 α-Humulene
23 α-Terpineol + borneol
24 Caryophyllene oxide
25 Viridiflorol