

Oil of amyris (*Amyris balsamifera* L.)

ICS 71.100.60

National foreword

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The UK participation in its preparation was entrusted to Technical Committee AW/54, Essential oils.

A list of organizations represented on this committee can be obtained on request to its secretary.

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2008

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ISBN 978 0 580 57078 0

Amendments/corrigenda issued since publication

Date	Comments

INTERNATIONAL STANDARD

ISO
3525

Second edition
2008-07-15

Oil of amyris (*Amyris balsamifera* L.)

Huile essentielle d'amyris (Amyris balsamifera L.)



Reference number
ISO 3525:2008(E)

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Published in Switzerland

Foreword

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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.

ISO 3525 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 3525:1979), which has been technically revised.

Oil of amyris (*Amyris balsamifera* L.)

1 Scope

This International Standard specifies certain characteristics of essential oil of amyris (*Amyris balsamifera* L.), with a view to facilitating the assessment of its quality.

2 Normative references

The following referenced documents are indispensable for the application 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/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 1242, *Essential oils — Determination of acid value*

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 Terms and definitions

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

3.1

essential oil of amyris

essential oil obtained by steam distillation of the wood of *Amyris balsamifera* L. of the Rutaceae family mainly distilled in Haiti

NOTE For information on the CAS number, see ISO/TR 21092^[2].

4 Requirements

4.1 Appearance

Clear, slightly viscous liquid.

4.2 Colour

Pale yellow to amber yellow.

4.3 Odour

Characteristic, woody.

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

Minimum: 0,946.

Maximum: 0,978.

4.5 Refractive index at 20 °C

Minimum: 1,504.

Maximum: 1,512.

4.6 Optical rotation at 20 °C

Between +20° and +45°.

4.7 Miscibility with 80 % (volume fraction) ethanol at 20 °C

It shall not be necessary to use more than 3 volumes of 80 % (volume fraction) ethanol to obtain a clear solution with 1 volume of essential oil. Sometimes opalescence can be observed on further addition of solvent.

4.8 Acid value

Maximum: 3,0.

4.9 Chromatographic profile

Analysis of the essential oil shall be carried out by gas chromatography. In the chromatogram obtained, the representative and characteristic constituents listed in Table 1 shall be identified. The percentages of these constituents, indicated by the integrator, shall be situated within the limits given in Table 1. This constitutes the chromatographic profile of the essential oil.

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 is sufficient for 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 with 80 % (volume fraction) ethanol at 20 °C

See ISO 875.

6.5 Acid value

See ISO 1242.

6.6 Chromatographic profile

See ISO 11024-1 and ISO 11024-2.

7 Packaging, labelling, marking, and storage

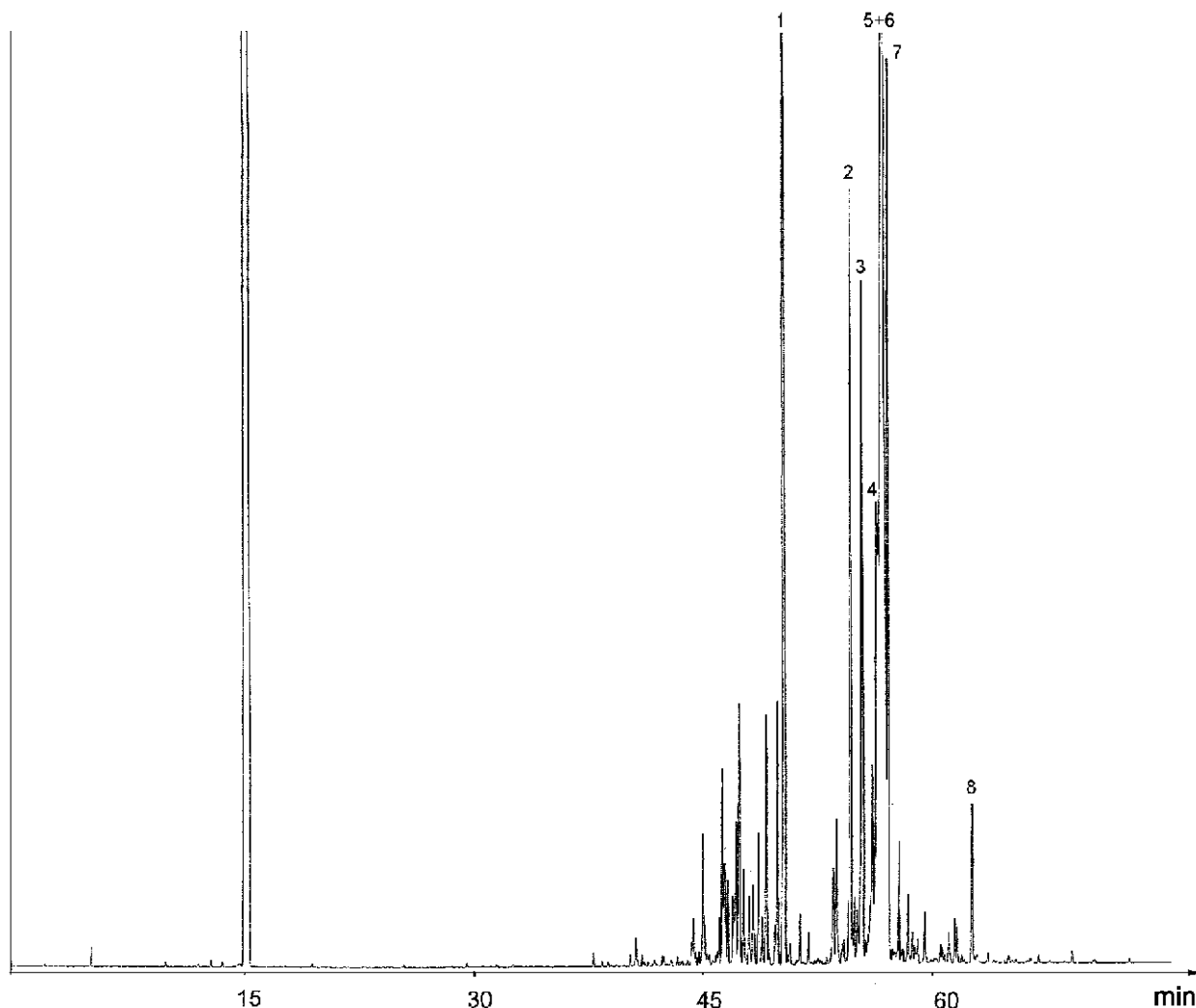
See ISO/TR 210 and ISO/TR 211.

Table 1 — Chromatographic profile

Component	Minimum %	Maximum %
Elemol	5,0	15,0
10- γ - <i>epi</i> -Eudesmol	6,0	12,0
γ -Eudesmol	4,0	12,0
Valerianol	15,0	35,0
α -Eudesmol	3,0	9,0
7- α - <i>epi</i> -Eudesmol	7,0	15,0
β -Eudesmol	2,5	11,0
Drimenol	0,7	5,0
NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A.		

Annex A
(informative)

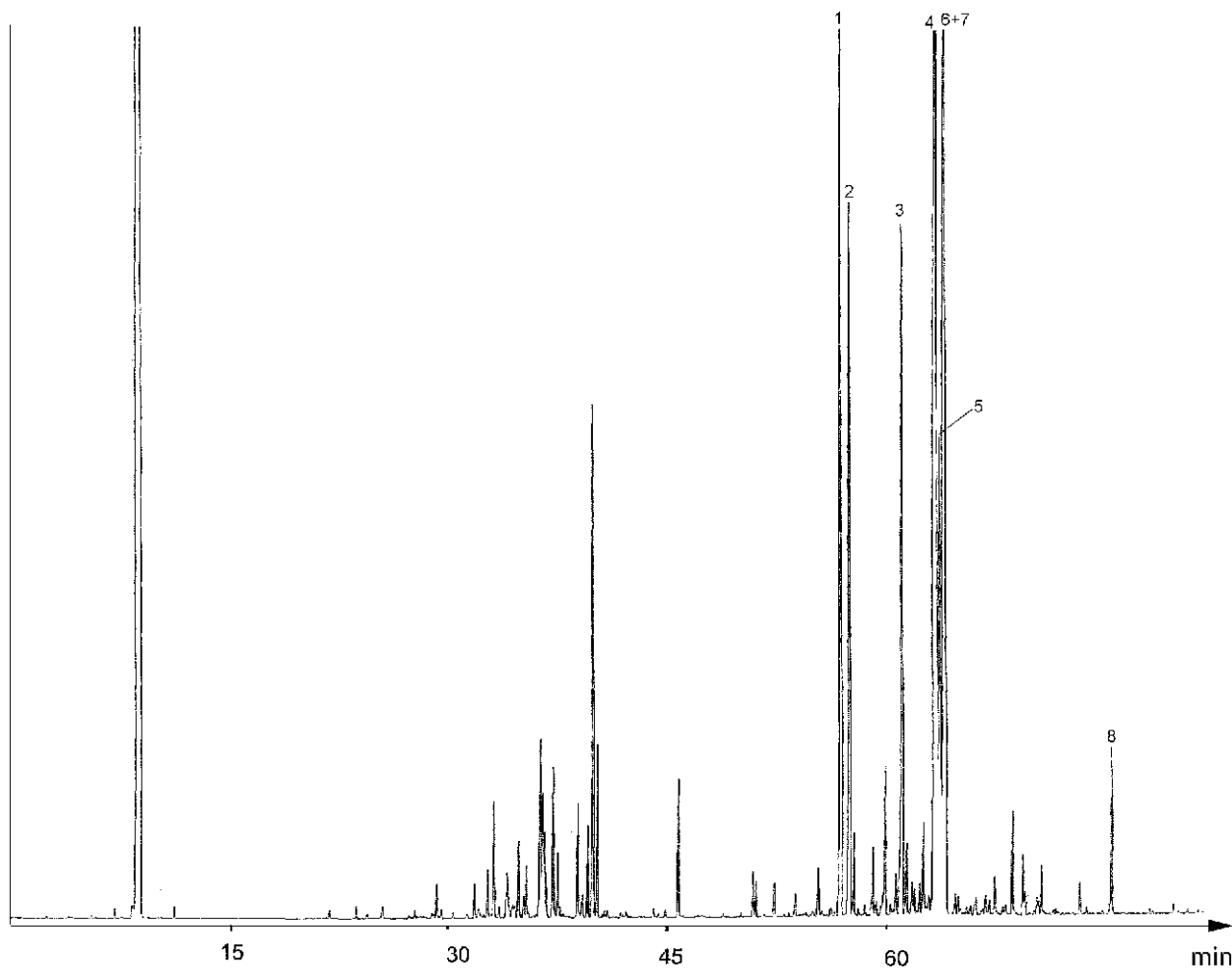
**Typical chromatograms of the analysis by gas chromatography
of the essential oil of amyris (*Amyris balsamifera* L.)**



Peak identification	Operating conditions
1 Elemol	Column: silica capillary; length 30 m; internal diameter, 320 µm
2 10- <i>γ-epi</i> -Eudesmol	Stationary phase: poly[(5% phenyl)(95 % methyl)siloxane] [HP-5 ¹⁾
3 <i>γ</i> -Eudesmol	Film thickness: 0,25 µm
4 <i>β</i> -Eudesmol	Oven temperature: isothermal at 70 °C during 10 min, then programming of temperature from 70 °C to 220 °C, at a rate of 2 °C/min
5 Valerianol	Injector temperature: 230 °C
6 <i>α</i> -Eudesmol	Detector temperature: 250 °C
7 7- <i>α-epi</i> -Eudesmol	Detector: flame ionization type
8 Drimenol	Carrier gas: hydrogen
	Volume injected: 0,2 µl
	Carrier gas flow rate: 1,1 ml/min
	Split ratio: 1/100

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

1) HP-5 is an example of a suitable product available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this product. Equivalent products may be used if they can be shown to lead to the same results.



Peak identification	Operating conditions
1 Elemol	Column: silica capillary; length 20 m; internal diameter 100 µm
2 10- γ - <i>epi</i> -Eudesmol	Stationary phase: poly(ethylene glycol) [Carbowax 20 M ²]
3 γ -Eudesmol	Film thickness: 0,2 µm
4 Valerianol	Oven temperature: isothermal at 50 °C for 1 min, then programming of temperature from 50 °C to 200 °C, at a rate of 10 °C/min
5 α -Eudesmol	Injector temperature: 230 °C
6 β -Eudesmol	Detector temperature: 250 °C
7 7- α - <i>epi</i> -Eudesmol	Detector: flame ionization type
8 Drimenol	Carrier gas: hydrogen
	Volume injected: 0,2 µl
	Carrier gas flow rate: 1,1 ml/min
	Split ratio: 1/100

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

2) Carbowax 20M is an example of a suitable product available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this product. Equivalent products may be used if they can be shown to lead to the same results.

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 flashpoints of essential oils, which in most cases are flammable products.

A comparative study on the relevant methods of analysis (see ISO/TR 11018^[1]) 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 highly 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 has to be specified.

For further information see ISO/TR 11018^[1].

B.2 Flashpoint of the essential oil of amyris (*Amyris balsamifera* L.)

The mean value is more than 100 °C.

NOTE Obtained with "Pensky-Martens" ³⁾ equipment.

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

Bibliography

- [1] ISO/TR 11018, *Essential oils — General guidance on the determination of flashpoint*
- [2] ISO/TR 21092, *Essential oils — Characterization*

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