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**Oil of amyris (*Amyris balsamifera* L.)**

*Huile essentielle d'amyris (Amyris balsamifera L.)*

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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 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.

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# 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<sup>[2]</sup>.

## 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<br>% | Maximum<br>% |
|--------------------------------------------------------------------------------------------------------------------|--------------|--------------|
| Elemol                                                                                                             | 5,0          | 15,0         |
| 10- $\gamma$ - <i>epi</i> -Eudesmol                                                                                | 6,0          | 12,0         |
| $\gamma$ -Eudesmol                                                                                                 | 4,0          | 12,0         |
| Valerianol                                                                                                         | 15,0         | 35,0         |
| $\alpha$ -Eudesmol                                                                                                 | 3,0          | 9,0          |
| 7- $\alpha$ - <i>epi</i> -Eudesmol                                                                                 | 7,0          | 15,0         |
| $\beta$ -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.)**

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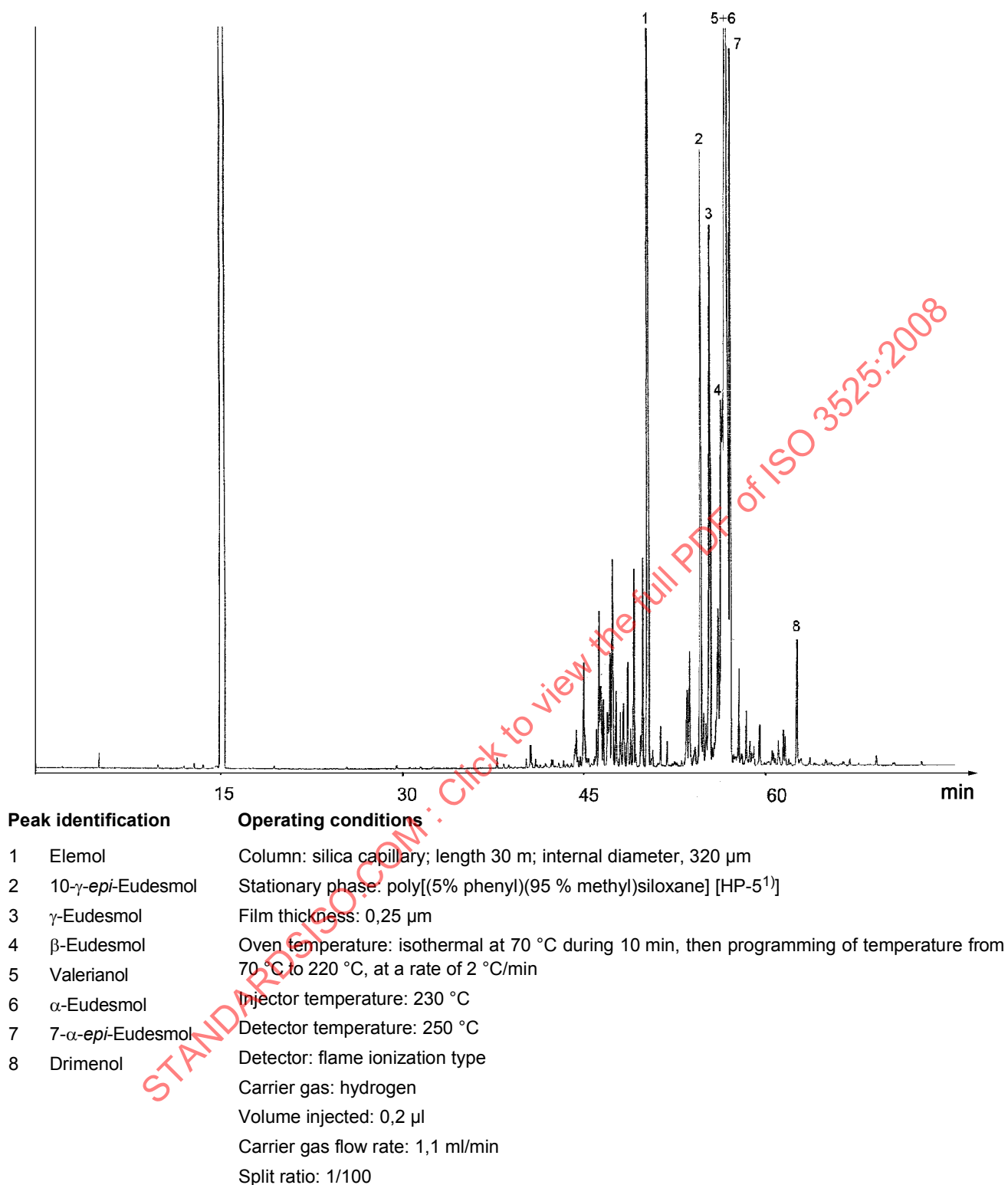
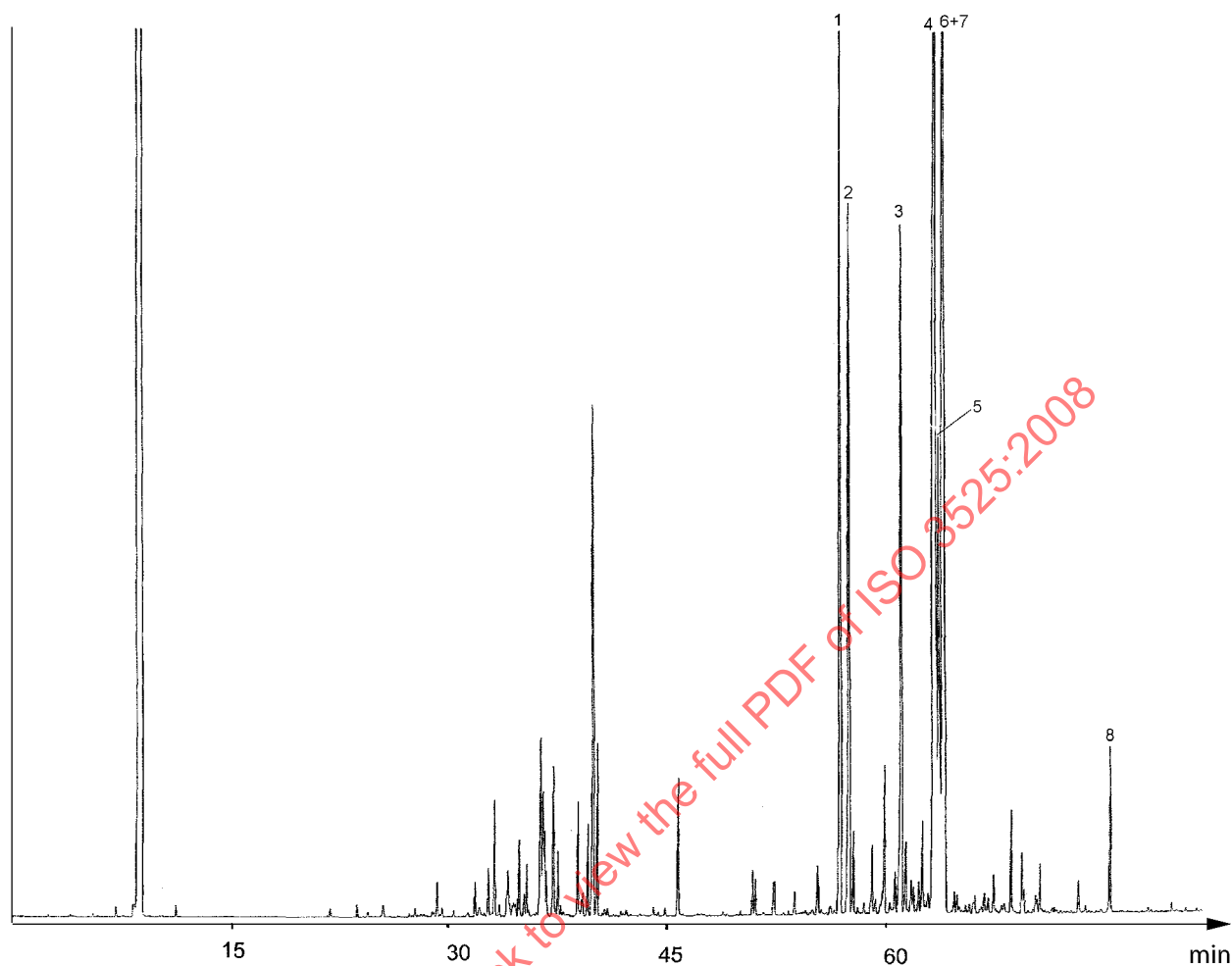


Figure A.1 — Typical chromatogram taken on an apolar column

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- <i>γ-epi</i> -Eudesmol | Stationary phase: poly(ethylene glycol) [Carbowax 20 M <sup>2)</sup> ]                                                        |
| 3 | <i>γ</i> -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 | <i>α</i> -Eudesmol         | Injector temperature: 230 °C                                                                                                  |
| 6 | <i>β</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.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.