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**Oil of eucalyptus Australian type,  
containing a volume fraction of 80 % to  
85 % of 1,8-cineole**

*Huile essentielle d'eucalyptus, type Australie, contenant une fraction  
volumique de 1,8-cinéole comprise entre 80 % et 85 %*



Reference number  
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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 3065 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 3065:1974), which has been technically revised.

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# Oil of eucalyptus Australian type, containing a volume fraction of 80 % to 85 % of 1,8-cineole

## 1 Scope

This International Standard specifies certain characteristics of the oil of eucalyptus Australian type, containing a volume fraction of 80 % to 85 % of 1,8-cineole, in order to facilitate 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 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

#### **oil of eucalyptus Australian type, containing a volume fraction of 80 % to 85 % of 1,8-cineole**

essential oil containing a volume fraction in the range 80 % to 85 % of 1,8-cineole, obtained by steam distillation of foliage of eucalyptus, primarily *Eucalyptus polybractea* R. Baker, as well as other species such as *E. radiata* Sieber ex DC. ssp. *radiata*, *E. smithii* R. Baker, *E. plenissima* (C. Gardner) Brooker, *E. dives* Schauer and any other eucalyptus species rich in 1,8-cineole

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

## 4 Requirements

### 4.1 Appearance

Clear, mobile liquid.

### 4.2 Colour

Colourless to pale yellow.

### 4.3 Odour

Fresh, aromatic, and characteristic of 1,8-cineole.

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

Minimum: 0,906

Maximum: 0,928

### 4.5 Refractive index at 20 °C

Minimum: 1,457

Maximum: 1,465

### 4.6 Optical rotation at 20 °C

Minimum: 0°

Maximum: +5°

### 4.7 Miscibility in 70 % (volume fraction) ethanol at 20 °C

It shall not be necessary to use more than 3 volumes of 70 % (volume fraction) ethanol to obtain a clear solution with 1 volume of essential oil.

### 4.8 Chromatographic profile

Carry out the analysis of the essential oil by gas chromatography. Identify in the chromatogram obtained the representative and characteristic components listed in Table 1. The proportions of these components, indicated by the integrator, shall be situated within the limits specified in Table 1. This constitutes the chromatographic profile of the essential oil.

### 4.9 Flashpoint

Information on the flashpoint is given in Annex B.

Table 1 — Chromatographic profile

Component	Minimum %	Maximum %
$\alpha$ -Pinene	0,1	9
Camphene	n.d. <sup>a</sup>	0,2
$\beta$ -Pinene	n.d. <sup>a</sup>	1,5
Sabinene	n.d. <sup>a</sup>	2
$\alpha$ -Phellandrene	n.d. <sup>a</sup>	1,5
Limonene	0,1	12
1,8-Cineole	80	85
<i>p</i> -Cymene	0,5	4
$\alpha$ -Terpineol	n.d. <sup>a</sup>	12
Camphor	n.d. <sup>a</sup>	0,1
NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A.		
<sup>a</sup> Not detectable.		

## 5 Sampling

See ISO 212.

Minimum volume of final sample: 50 ml.

NOTE This volume is sufficient to carry out all the tests specified in this International Standard 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 70 % (volume fraction) ethanol at 20 °C

See ISO 875.

### 6.5 Chromatographic profile

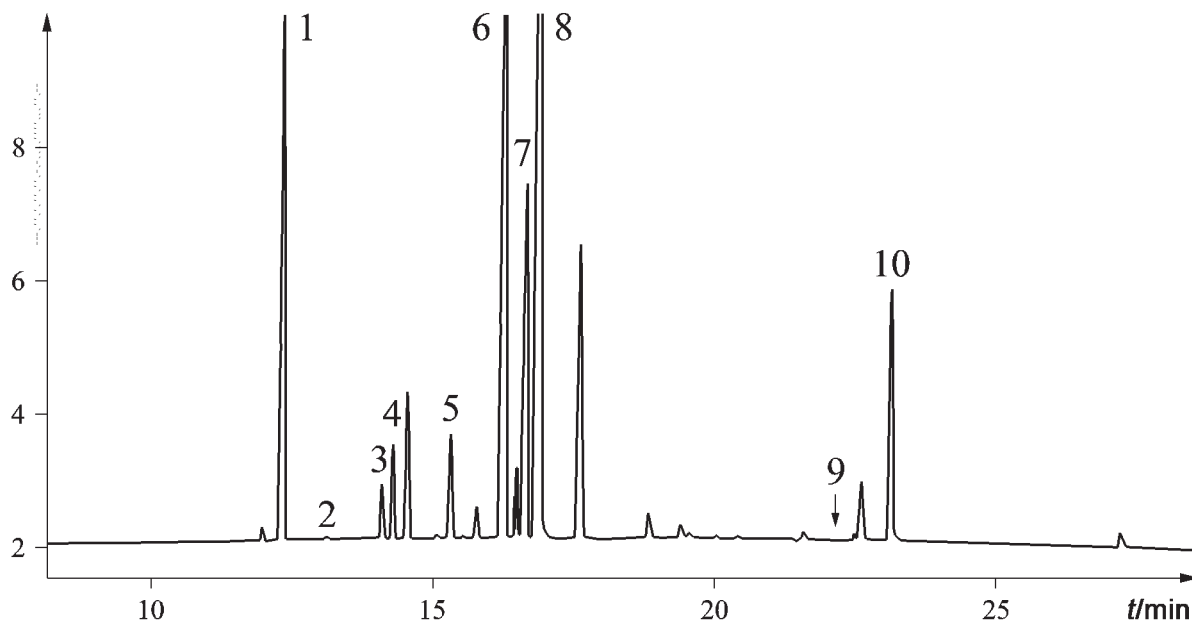
See ISO 11024-1 and ISO 11024-2.

## 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 oil of eucalyptus Australian type, containing a volume fraction of 80 % to 85 % of 1,8-cineole



#### Peak identification

- 1  $\alpha$ -pinene
- 2 camphene
- 3 sabinene
- 4  $\beta$ -pinene
- 5  $\alpha$ -phellandrene
- 6 limonene
- 7 *p*-cymene
- 8 1,8-cineole
- 9 camphor
- 10  $\alpha$ -terpineol

*t* time

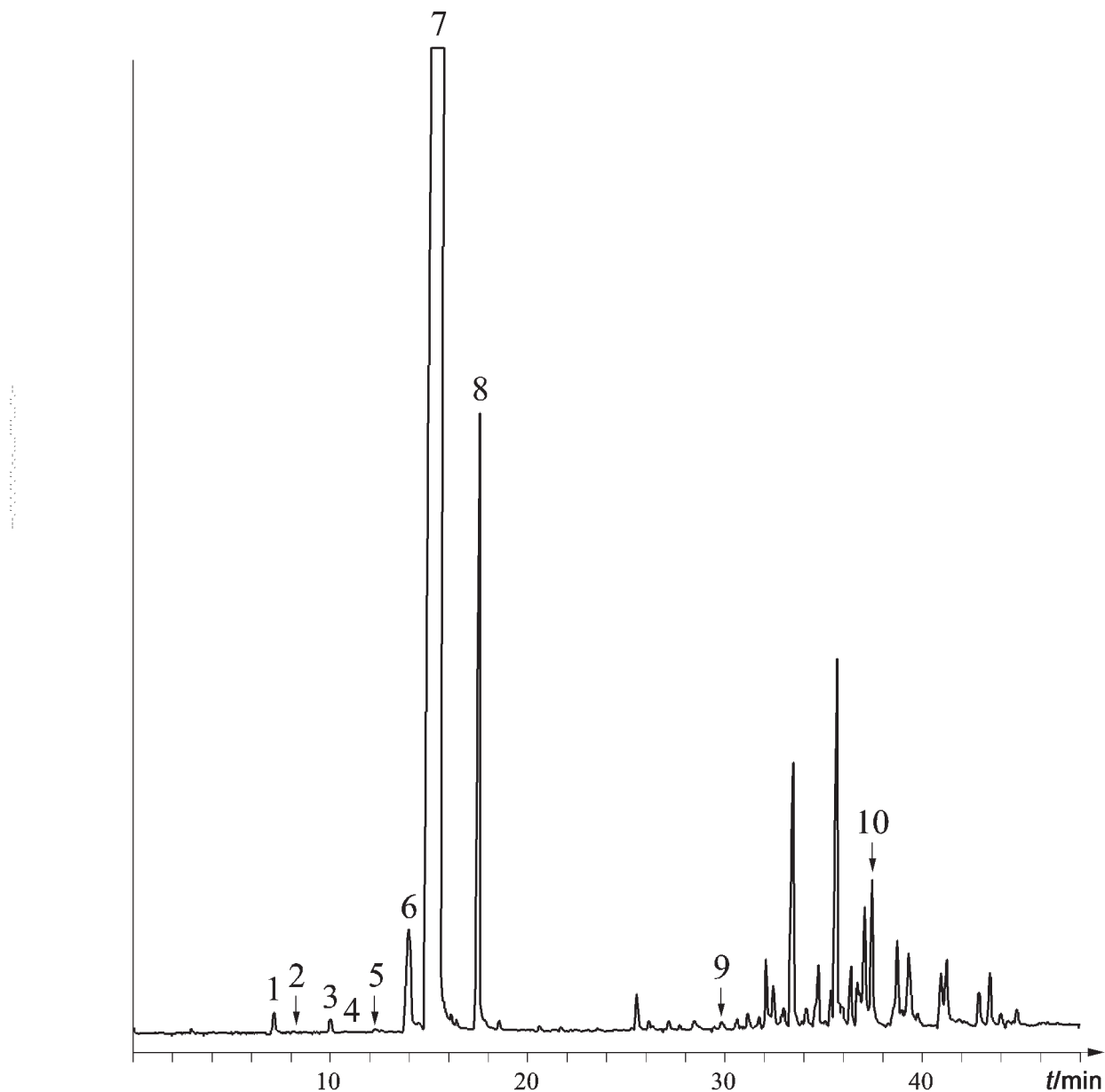
#### Operating conditions

Column: capillary, length 60 m, internal diameter 0,25 mm  
 Stationary phase: 35 %-phenyl-65 %-methylpolysiloxane [AT-35<sup>1</sup>]  
 Film thickness: 0,25  $\mu$ m  
 Oven temperature: Isothermal at 50 °C for 1 min, then temperature programming from 50 °C to 120 °C at 4 °C/min, then temperature programming from 120 °C to 250 °C at 8 °C/min, then isothermal at 250 °C for 10 min  
 Injector temperature: 270 °C  
 Detector temperature: 300 °C  
 Detector: flame ionization type  
 Carrier gas: hydrogen  
 Volume injected: 0,06  $\mu$ l  
 Carrier gas flow rate: 1 ml/min  
 Split: 1/80

**Figure A.1 — Typical chromatogram taken using a medium polarity column**

1) AT-35 is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product.



**Peak identification**

- 1  $\alpha$ -pinene
- 2 camphene
- 3  $\beta$ -pinene
- 4 sabinene
- 5  $\alpha$ -phellandrene
- 6 limonene
- 7 1,8-cineole
- 8 *p*-cymene
- 9 camphor
- 10  $\alpha$ -terpineol

*t* time

**Operating conditions**

Column: fused silica capillary, length 60 m, internal diameter 0,25 mm  
 Stationary phase: polyethylene glycol [DB-WAX<sup>2</sup>]  
 Film thickness: 0,25  $\mu$ m  
 Oven temperature: Isothermal at 35 °C for 10 min, then temperature programming from 35 °C to 65 °C at 5 °C/min, then isothermal at 240 °C for 5 min  
 Injector temperature: 280 °C  
 Detector temperature: 250 °C  
 Detector: flame ionisation type  
 Carrier gas: helium  
 Volume injected: 0,1  $\mu$ l  
 Lineal rate: 4 ml/min  
 Split: 1/100

**Figure A.2 — Typical chromatogram taken using a polar column**

2) DB-WAX is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product.

## 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 flash points of essential oils, which in most cases are flammable products.

A comparative study on the relevant methods of analysis (see ISO/TR 11018<sup>[1]</sup>) 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 for certain equipment is incompatible with the high price of 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<sup>[1]</sup>.

#### B.2 Flashpoint of the essential oil of eucalyptus Australian type, containing a volume fraction of 80 % to 85 % of 1,8-cineole

The mean value is +48 °C.

NOTE Obtained with Pensky-Martens<sup>3)</sup> equipment.

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3) Equipment available commercially. This information is given for the convenience of users of this document 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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