
**Oil of *Melaleuca*, terpinen-4-ol type
(Tea Tree oil)**

*Huile essentielle de Melaleuca, type terpinén-4-ol (huile essentielle de
«Tea Tree»)*

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

[ISO 4730:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/9ade6d89-3918-4254-8e35-02f2ec3fdb73/iso-4730-2004>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 4730:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/9ade6d89-3918-4254-8e35-02f2ec3fdb73/iso-4730-2004>

© ISO 2004

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

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 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 4730 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 4730:1996), which has been technically revised.

TECHNICAL STANDARD PREVIEW
(standards.iteh.ai)

[ISO 4730:2004](https://standards.iteh.ai/catalog/standards/sist/9ade6d89-3918-4254-8e35-02f2ec3fdb73/iso-4730-2004)

<https://standards.iteh.ai/catalog/standards/sist/9ade6d89-3918-4254-8e35-02f2ec3fdb73/iso-4730-2004>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 4730:2004

<https://standards.iteh.ai/catalog/standards/sist/9ade6d89-3918-4254-8e35-02f2ec3fdb73/iso-4730-2004>

Oil of *Melaleuca*, terpinen-4-ol type (Tea Tree oil)

1 Scope

This International Standard specifies certain characteristics of the oil of *Melaleuca*, terpinen-4-ol type (Tea Tree oil), 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 *Melaleuca*, terpinen-4-ol type Tea Tree oil

essential oil obtained by steam distillation of the foliage and terminal branchlets of *Melaleuca alternifolia* (Maiden et Betche) Cheel, *Melaleuca linariifolia* Smith, and *Melaleuca dissitiflora* F. Mueller, as well as other species of *Melaleuca* provided that the oil obtained conforms to the requirements given in this International Standard

NOTE For information on the CAS number, see ISO/TR 21092.

4 Requirements

4.1 Appearance

Clear, mobile liquid.

4.2 Colour

Colourless to pale yellow.

4.3 Odour

Characteristic.

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

Minimum: 0,885

Maximum: 0,906

4.5 Refractive index at 20 °C

Minimum: 1,475 0

Maximum: 1,482 0

4.6 Optical rotation at 20 °C

Between +5° and +15°.

4.7 Miscibility in ethanol, 85 % (volume fraction), at 20 °C

It shall not be necessary to use more than 2 volumes of ethanol, 85 % (volume fraction), to obtain a clear solution with 1 volume of essential oil.

4.8 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

Components	Minimum %	Maximum %
α-Pinene	1	6
Sabinene	trace	3,5
α-Terpinene	5	13
Limonene	0,5	1,5
p-Cymene	0,5	8
1,8-Cineole	trace	15
γ-Terpinene	10	28
Terpinolene	1,5	5
Terpinen-4-ol	30	48
α-Terpineol	1,5	8
Aromadendrene	trace	3
Ledene (syn. viridiflorene)	trace	3
δ-Cadinene	trace	3
Globulol	trace	1
Viridiflorol	trace	1

NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A.

4.9 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.

6.3 Optical rotation at 20 °C

See ISO 592.

6.4 Miscibility in ethanol, 85 % (volume fraction), at 20 °C

See ISO 875.

6.5 Chromatographic profile

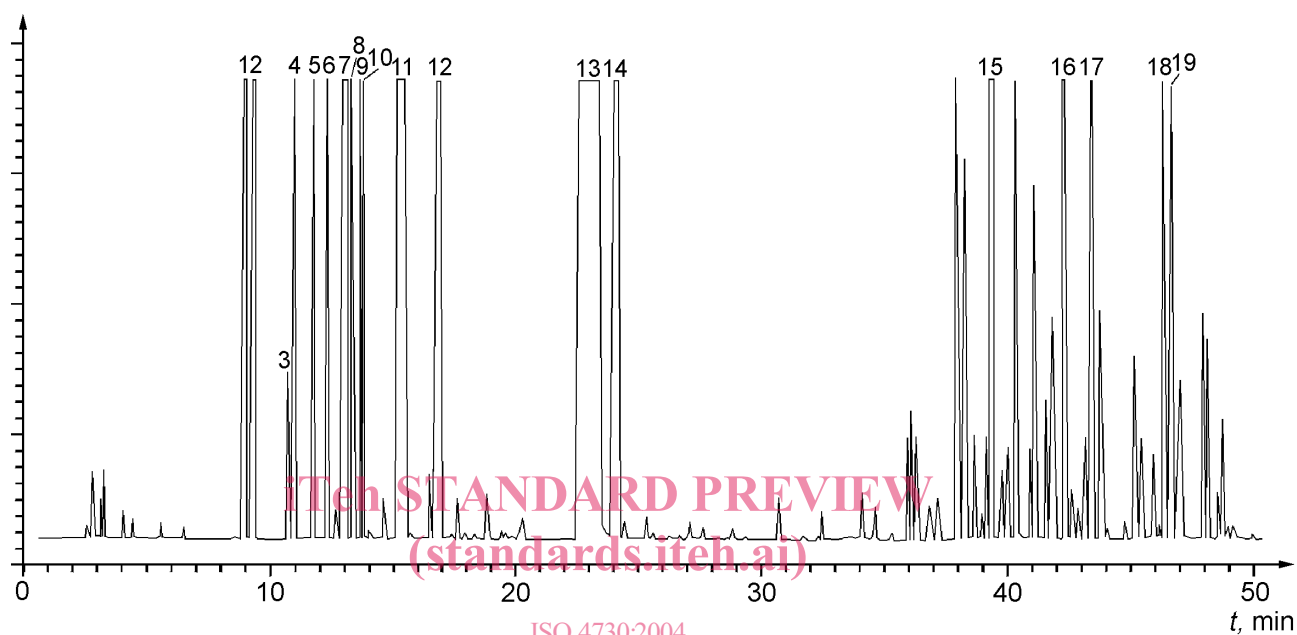
See ISO 11024-1 and ISO 11024-2.

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 *Melaleuca*, terpinen-4-ol type (Tea Tree oil)



ISO 4730:2004

<https://standards.iteh.ai/catalog/standards/sist/9ade6d89-3918-4254-8e35-0212cc31d679/iso-4730-2004>

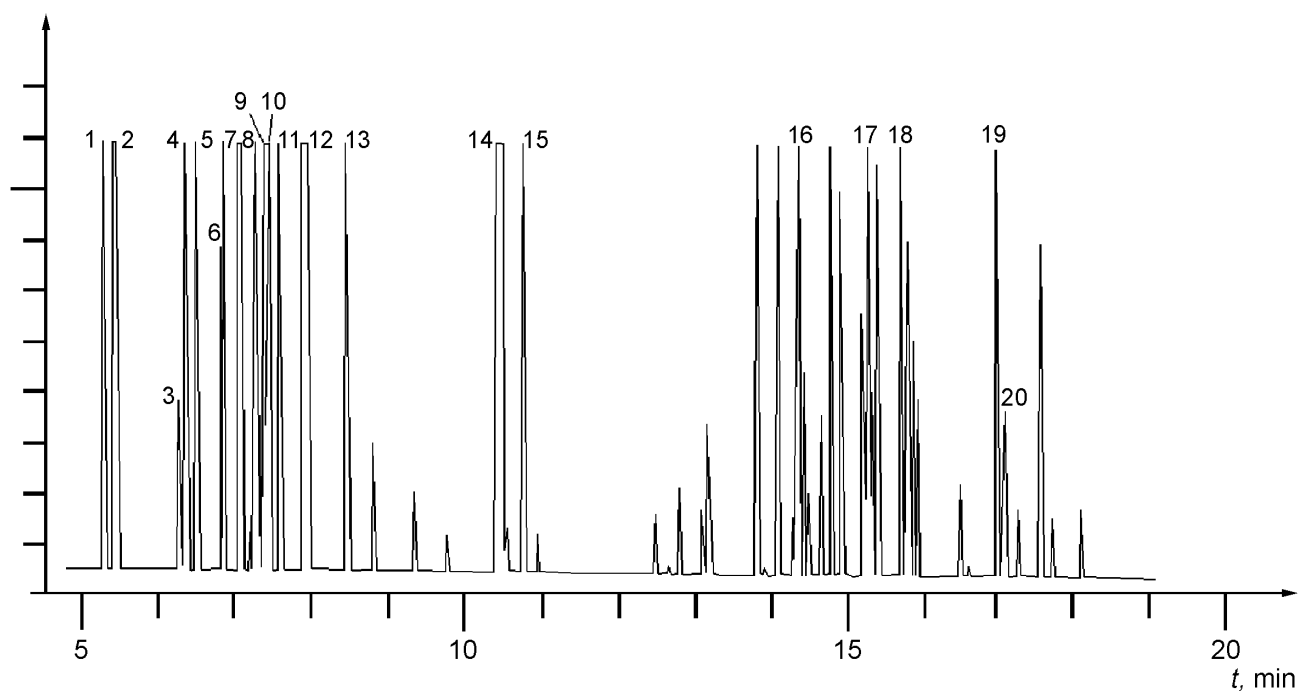
Peak identification

- 1 α -Thujene
- 2 α -Pinene
- 3 Sabinene
- 4 β -Pinene
- 5 Myrcene
- 6 α -Phellandrene
- 7 α -Terpinene
- 8 *p*-Cymene
- 9 1,8-Cineole + β -phellandrene
- 10 Limonene
- 11 γ -Terpinene
- 12 Terpinolene
- 13 Terpinen-4-ol
- 14 α -Terpineol
- 15 Aromadendrene
- 16 Ledene (viridiflorene)
- 17 δ -Cadinene
- 18 Globulol
- 19 Viridiflorol

Operating conditions

Column: fused silica capillary; length 50 m; internal diameter 0,20 mm
 Stationary phase: poly(dimethyl siloxane) (OV-101®)
 Film thickness: 0,25 μ m
 Oven temperature: temperature programming from 70 °C to 220 °C at a rate of 2 °C/min
 Injector temperature: 230 °C
 Detector temperature: 250 °C
 Detector: flame ionization type
 Carrier gas: hydrogen
 Volume injected: 0,2 μ l
 Carrier gas flow rate: 1,0 ml/min
 Split ratio: 1/100

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

**Peak identification**

- 1 α -Thujene
- 2 α -Pinene
- 3 Sabinene
- 4 β -Pinene
- 5 Myrcene
- 6 α -Phellandrene
- 7 α -Terpinene
- 8 Limonene
- 9 β -Phellandrene
- 10 *p*-Cymene
- 11 1,8-Cineole
- 12 γ -Terpinene
- 13 Terpinolene
- 14 Terpinen-4-ol
- 15 α -Terpineol
- 16 Aromadendrene
- 17 Ledene (viridiflorene)
- 18 δ -Cadinene
- 19 Globulol
- 20 Viridiflorol

Operating conditions

Column: FSOT; length 60 m; internal diameter 0,25 mm
 Stationary phase: (35 %)-diphenyl-(65 %)-methylsiloxane copolymer (AT-35®)
 Film thickness: 0,25 μ m
 Oven temperature: isothermal at 50 °C for 1 min, then temperature programming from 50 °C to 250 °C at a rate of 10 °C/min and isothermal at 250 °C for 9 min
 Injector temperature: 200 °C
 Detector temperature: 300 °C
 Detector: flame ionization type
 Carrier gas: hydrogen
 Volume injected: 1 μ l (1 % in ethanol)
 Carrier gas flow rate: 1,0 ml/min
 Split ratio: 1/50

Figure A.2 — Typical chromatogram taken on an intermediate polarity column

