INTERNATIONAL STANDARD

ISO 3044

Third edition
2020-07

Essential oil of *Corymbia citriodora* (Hook.) K.D. Hill and L.A.S. Johnson (syn. *Eucalyptus citriodora* Hook.)

Huile essentielle de Corymbia citriodora *(Hook.) K.D. Hill et L.A.S. Johnson (syn.* Eucalyptus citriodora *Hook.)*

Reference number
ISO 3044:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO 3044:1997), which has been technically revised.

The main changes to the previous edition are as follows:

— the title and botanical name of the essential oil source have been updated to the currently accepted botanical name;

— the structure of the document has been revised;

— determination of carbonyl value using the free hydroxyl amine method has been removed;

— Table 2 has been revised for minimum and maximum values and to include the extra components 1,8-cineole, citronellol and citronellyl acetate;

— Annex A has been replaced with an updated Figure A.1 and Figure A.2 and with revised peak identification and operating conditions columns.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Essential oil of *Corymbia citriodora* (Hook.) K.D. Hill and L.A.S. Johnson (syn. *Eucalyptus citriodora* Hook.)

1 Scope

This document specifies certain characteristics of the essential oil of *Corymbia citriodora* (Hook.) K.D. Hill and L.A.S. Johnson (syn. *Eucalyptus citriodora* Hook.) with a view to facilitating the assessment of its quality.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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/TS 210, *Essential oils — General rules for packaging, conditioning and storage*

ISO/TS 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 degrees 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 (all parts), *Essential oils — General guidance on chromatographic profiles*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
essential oil of *Corymbia citriodora*
essential oil obtained by steam distillation of the leaves and twigs of *Corymbia citriodora* (Hook.) K.D. Hill and L.A.S. Johnson of the Myrtaceae family

Note 1 to entry: For information on the CAS number see ISO/TR 21092.

4 Requirements

4.1 General requirements

The essential oil of *Corymbia citriodora* shall meet the requirements given in Table 1.

Table 1 — Requirements for the essential oil of *Corymbia citriodora*

Characteristic	Requirements	ISO test method
Appearance	Clear mobile liquid	—
Colour	Almost colourless, pale yellow to greenish yellow	—
Odour	Characteristic, recalling that of citronellal	—
Relative density at 20 °C d_{20}^{20}	0,860 to 0,880	ISO 279
Refractive index at 20 °C	1,450 to 1,460	ISO 280
Optical rotation at 20 °C	Range from −1° to +3°	ISO 592
Miscibility in ethanol	It shall not be necessary to use more than four volumes of ethanol 70 % (volume fraction) to obtain a clear solution with one volume of essential oil	ISO 875

4.2 Chromatographic profile

Carry out the analysis of the essential oil by gas chromatography. Determine the chromatographic profile in accordance with the ISO 11024 series. Identify in the chromatogram obtained the representative and characteristic components shown in Table 2. The proportions of these components, indicated by the integrator, shall be as shown in Table 2. This constitutes the chromatographic profile of the essential oil.

Table 2 — Chromatographic profile

Component	Min	Max
	%	%
1,8-Cineole	0,5	3,0
neo-Isopulegol + Isopulegol	5,0	10,0
Citronellal	75,0	85,0
Citronellol	3,0	10,0
Citronellyl acetate	0,1	2,0
NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A, see Figures A.1 and A.2.		

5 Flash point

Information on the flash point is given in Annex B.

6 Sampling

Sampling shall be performed in accordance with ISO 212. The minimum test sample volume is 50 ml.

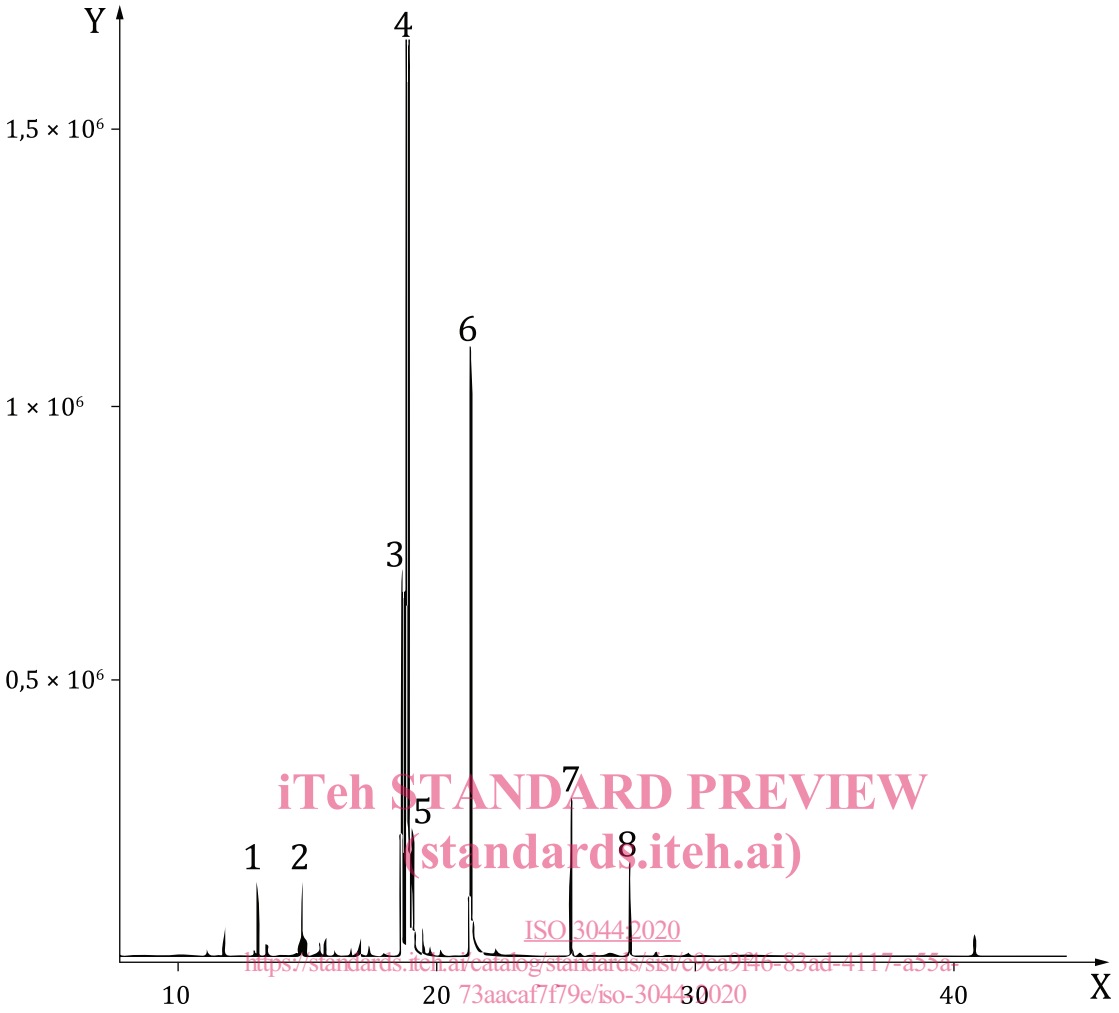
NOTE This volume allows each of the tests specified in this document to be carried out at least once.

7 Packaging, labelling, marking and storage

Packaging labelling, marking and storage shall be in accordance with ISO/TS 210 and ISO/TS 211.

Annex A
(informative)

Typical chromatograms of the analysis by gas chromatography of the essential oil of *Corymbia citriodora* (Hook.) K.D. Hill and L.A.S. Johnson (syn. *Eucalyptus citriodora* Hook.)



	Peak identification	Operating conditions
1	β-Pinene	Column: capillary, length 60 m, internal diameter 0,25 mm
2	1,8-Cineole	Stationary phase: Rtx-5MS[a] (5 % diphenyl, 95 % dimethyl polysiloxane)
3	Isopulegol	Film thickness: 0,10 µm
4	Citronellal	Oven temperature: 45° to 240° at a rate of 4 °C/min, hold 11,25 min
5	*neo*-Isopulegol	Injector temperature: 230 °C
6	Citronellol	Detector temperature: 250 °C
7	Citronellyl acetate	Detector: flame ionization
8	β-Caryophyllene	Carrier gas: helium
		Injected volume: 1 µl
		Carrier gas flowrate: 2,1 ml/min
		Sample: 2,5 % (m/V) in hexane
		Split ratio: 1/40

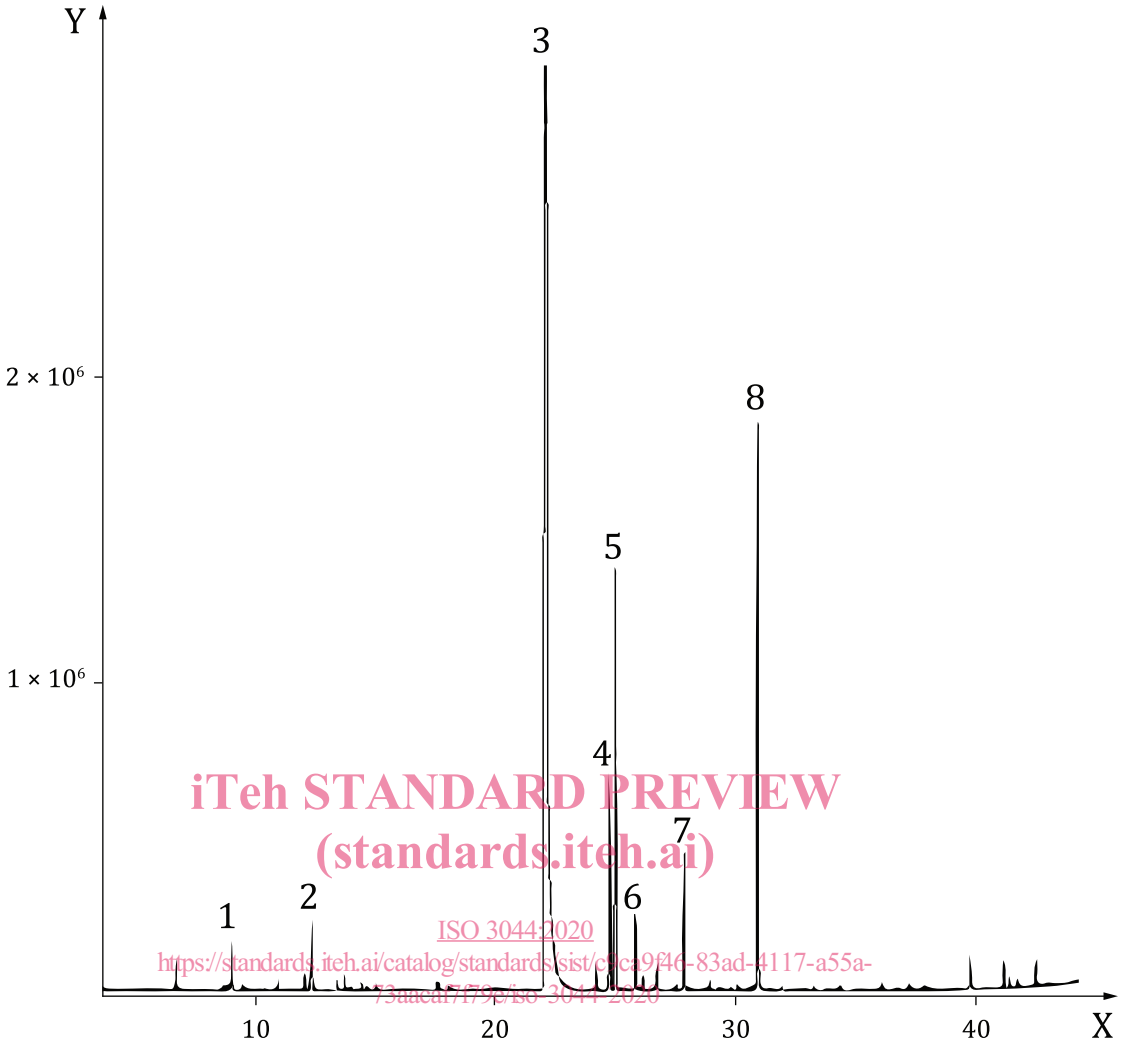
Key

Y detector response (pA)

X time (min)

[a] Rtx-5MS 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.

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



	Peak identification
1	β-Pinene
2	1,8-Cineole
3	Citronellal
4	*neo*-Isopulegol
5	Isopulegol
6	β-Caryophyllene
7	Citronellyl acetate
8	Citronellol

Operating conditions

Column: capillary, length 60 m, internal diameter 0,32 mm

Stationary phase: Rtx-Wax[a] (Crossbond Carbowax polyethylene glycol)

Film thickness: 0,25 µm

Oven temperature: 45° hold 3 min, 45° to 180° at a rate of 4 °C/min, 180° to 240° at a rate of 8 °C/min, hold 15 min

Injector temperature: 240 °C

Detector temperature: 260 °C

Detector: flame ionization

Carrier gas: helium

Injected volume: 1 µl

Carrier gas flowrate: 2,0 ml/min

Sample: 2,5 % (m/V) in hexane

Split ratio: 1/27,8