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BSI Standards Publication

Essential oil of citronella, Java type

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National foreword

This British Standard is the UK implementation of ISO 3848:2016.

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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2016-11-01

Essential oil of citronella, Java type

Huile essentielle de citronnelle, type Java

Reference number
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Foreword

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 54, *Essential oils*.

This third edition cancels and replaces the second edition (ISO 3848:2001) which has been technically revised. It also incorporates the Technical Corrigendum ISO 3848:2001/Cor.1:2002.

Essential oil of citronella, Java type

1 Scope

This document specifies certain characteristics of the essential oil of citronella, Java type, in order to facilitate 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 °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:

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

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

3.1
essential oil of citronella, Java type
essential oil obtained by steam distillation of the aerial parts, fresh or partially dried, of *Cymbopogon winterianus* Jowitt, cultivated in South-East Asia, China, India, Indonesia, Central and South America

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

4 Requirements

4.1 Essential oil of citronella, Java type shall meet the requirements as given in Table 1.

Table 1 — Requirements for the essential oil of citronella, Java type

Characteristics	Requirements	Test method
Appearance	Clear, sometimes slightly opalescent, mobile liquid	—
Colour	Pale yellow to pale yellowish brown	—
Odour	Slightly sweet, floral, rosy, lemon-like	—
Relative density at 20 °C, d_{20}^{20}	0,880 to 0,902	ISO 279
Refractive index at 20 °C	1,466 3 to 1,477 0	ISO 280
Optical rotation at 20 °C	Between –5° and +1	ISO 592
Miscibility in ethanol, 80 % (volume fraction), at 20 °C	It shall not be necessary to use more than 2 volumes of ethanol, 80 % (volume fraction), to obtain a clear solution with 1 volume of essential oil. Sometimes opalescence can arise on continuing the addition of ethanol.	ISO 875

4.2 Carry out the analysis of the essential oil by gas chromatography. Determine the chromatographic profile in accordance with ISO 11024 (all parts). 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[a]	Minimum %	Maximum %
Limonene	2,0	5,0
Citronellal	31,0	40,0
Linalool	0,5	1,5
Isopulegol	0,5	1,7
β-Elemene	0,7	2,5
Citronellyl acetate	2,0	4,0
Germacrene-D	1,5	3,0
Geranial	0,3	1,0
Geranyl acetate[b]	2,5	5,5
δ-Cadinene[b]	1,5	2,5
Citronellol	8,5	14,0
Geraniol	20,0	25,0
Elemol	1,3	4,8
Eugenol	0,5	1,0

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

[a] Components are listed according to their elution order on a polar column (see Figure A.2).

[b] Area %: Values based on apolar column data (see Figure A.1).

5 Flashpoint

Information on the flashpoint is given in Annex B.

6 Sampling

Sampling shall be performed in accordance with ISO 212.

Minimum volume of test sample: 50 ml.

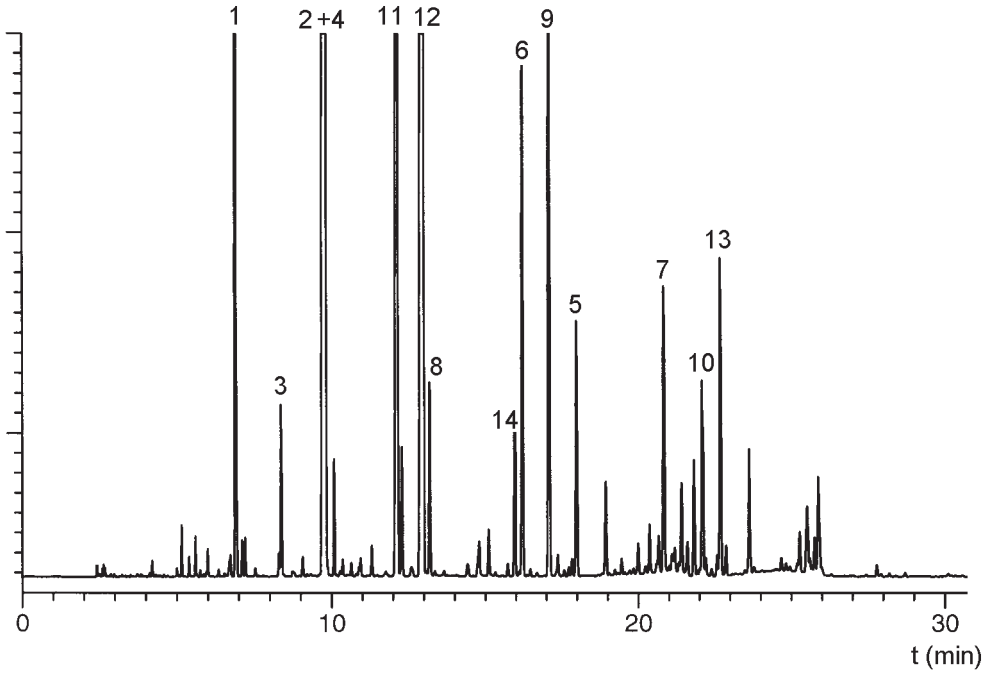
NOTE This volume allows each of the tests specified in this document to be carried out at least once.

7 Packaging, labelling, marking and storage

These items shall be in accordance with ISO/TS 210 and ISO/TS 211.

Annex A
(informative)

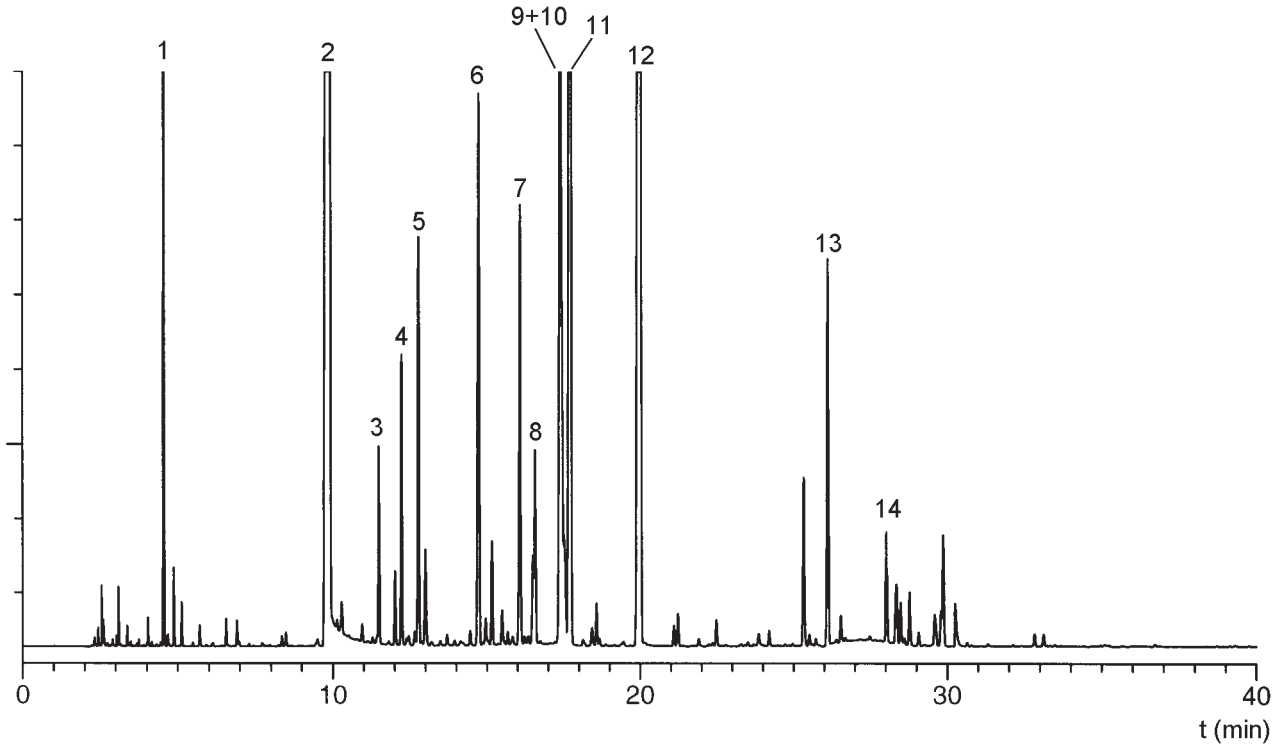
Typical chromatograms of the analysis by gas chromatography of the essential oil of citronella, Java type



Peak identification		Operating conditions
1	Limonene	Column: capillary, fused silica; length 60 m; internal diameter 0,32 mm
2+4	Citronellal + Isopulegol	Film thickness: 0,25 µm
3	Linalool	Stationary phase: polydimethyl siloxane [DB-1[a]]
5	β-Elemene	Oven temperature: temperature programming from 80 °C to 220 °C at a rate of 4 °C/min
6	Citronellyl acetate	
7	Germacrene-D	Injector temperature: 250 °C
8	Geranial	Detector temperature: 280 °C
9	Geranyl acetate	Detector: flame ionization type
10	δ-Cadinene	Carrier gas: helium
11	Citronellol	Volume injected: 0,15 µl
12	Geraniol	Carrier gas flow rate: 4 ml/min
13	Elemol	Split ratio: 1/40
14	Eugenol	

[a] DB-1 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 for essential oil of citronella, Java type



Peak identification		**Operating conditions**
1	Limonene	Column: capillary, fused silica; length 60 m; internal diameter 0,32 mm
2	Citronellal	Stationary phase: polyethylene glycol [DB-WAX[a]]
3	Linalool	Film thickness: 0,25 µm
4	Isopulegol	Oven temperature: temperature programming from 80 °C to 220 °C at a rate of 4 °C/min
5	β-Elemene	
6	Citronellyl acetate	Injector temperature: 250 °C
7	Germacrene-D	Detector temperature: 280 °C
8	Geranial	Detector: flame ionization type
9+10	Geranyl acetate + δ-cadinene	Carrier gas: helium
11	Citronellol	Volume injected: 0,15 µl
12	Geraniol	Carrier gas flow rate: 4 ml/min
13	Elemol	Split ratio: 1/40
14	Eugenol	

[a] 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.

Figure A.2 — Typical chromatogram taken on a polar column for essential oil of citronella, Java type

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) 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 high 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.

B.2 Flashpoint of the essential oil of citronella

The mean value is about +81 °C.

NOTE Obtained with "GRABNER INSTRUMENTS MINIFLASH-FLPL"[1)] equipment.

1) 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 3218, *Essential oils — Principles of nomenclature*

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

[3] ISO/TR 21092, *Essential oils — Characterization*

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