BRITISH STANDARD

BS ISO
3063:2004

Oil of ylang-ylang [*Cananga odorata* (Lam.) Hook. f.et Thompson forma *genuina*]

ICS 71.100.60

BSi
British Standards

National foreword

This British Standard reproduces verbatim ISO 3063:2004 and implements it as the UK national standard.

The UK participation in its preparation was entrusted to Technical Committee AW/54, Essential oils, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the ISO title page, pages ii to iv, pages 1 to 12, an inside back cover and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 29 November 2004

ISBN 0 580 44898 3

INTERNATIONAL STANDARD

ISO 3063

Second edition
2004-11-15

Oil of ylang-ylang [*Cananga odorata* (Lam.) Hook. f. et Thomson forma *genuina*]

*Huile essentielle d'ylang-ylang [*Cananga odorata *(Lam.) Hook. f. et Thomson forma* genuina*]*

Reference number
ISO 3063:2004(E)

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.

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 3063 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 3063:1983), which has been technically revised.

Oil of ylang-ylang [*Cananga odorata* (Lam.) Hook. f. et Thomson forma *genuina*]

1 Scope

This International Standard specifies certain characteristics of the oil of ylang-ylang [*Cananga odorata* (Lam.) Hook. f. et Thomson forma *genuina*] from Madagascar, Mayotte and Comores, 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 709, *Essential oils — Determination of ester value*

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
oil of ylang-ylang
essential oil obtained by steam distillation of the fresh flowers of *Cananga odorata* (Lam.) Hook. f. et Thomson forma *genuina*, of the Annonaceae family, growing mainly in Madagascar, Mayotte and Comores

NOTE 1 This volatile product is not generally collected as a whole oil, but in five successive fractions during the course of distillation. These five fractions, known respectively as “Extra super”, “Extra”, “First”, “Second” and “Third”, are the oils usually found in the trade.

NOTE 2 For information on the CAS number, see ISO/TR 21092.

4 Requirements

4.1 Appearance

Liquid.

4.2 Colour

Pale yellow to dark yellow.

4.3 Odour

Characteristic, floral and recalling jasmine.

4.4 Physical and chemical requirements

See Table 1.

4.5 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 2 shall be identified. 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.

4.6 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 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 Acid value

See ISO 1242.

6.5 Ester value

See ISO 709.

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 — Physical and chemical requirements

Characteristics	Fractions								
	Extra super	Extra		First		Second		Third	
	Comores and Mayotte	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar
Relative density at 20 °C d_{20}^{20}									
Min.	0,970	0,955	0,950	0,938	0,933	0,925	0,922	0,906	0,906
Max.	0,990	0,976	0,965	0,960	0,949	0,945	0,942	0,925	0,925
Refractive index at 20 °C									
Min.	1,497	1,498	1,493	1,501	1,495	1,502	1,496	1,503	1,502
Max.	1,505	1,506	1,509	1,509	1,510	1,511	1,511	1,513	1,513
Optical rotation at 20 °C									
Min.	– 33°	– 40°	– 42°	– 46°	– 46°	– 60°	– 58°	– 72°	– 70°
Max.	– 12,5°	– 20°	– 20°	– 25°	– 24°	– 35°	– 30°	– 45°	– 45°
Acid value	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Ester value									
Min.	160	140	125	100	90	75	65	45	40
Max.	200	185	160	160	125	115	95	75	70

Table 2 — Chromatographic profile

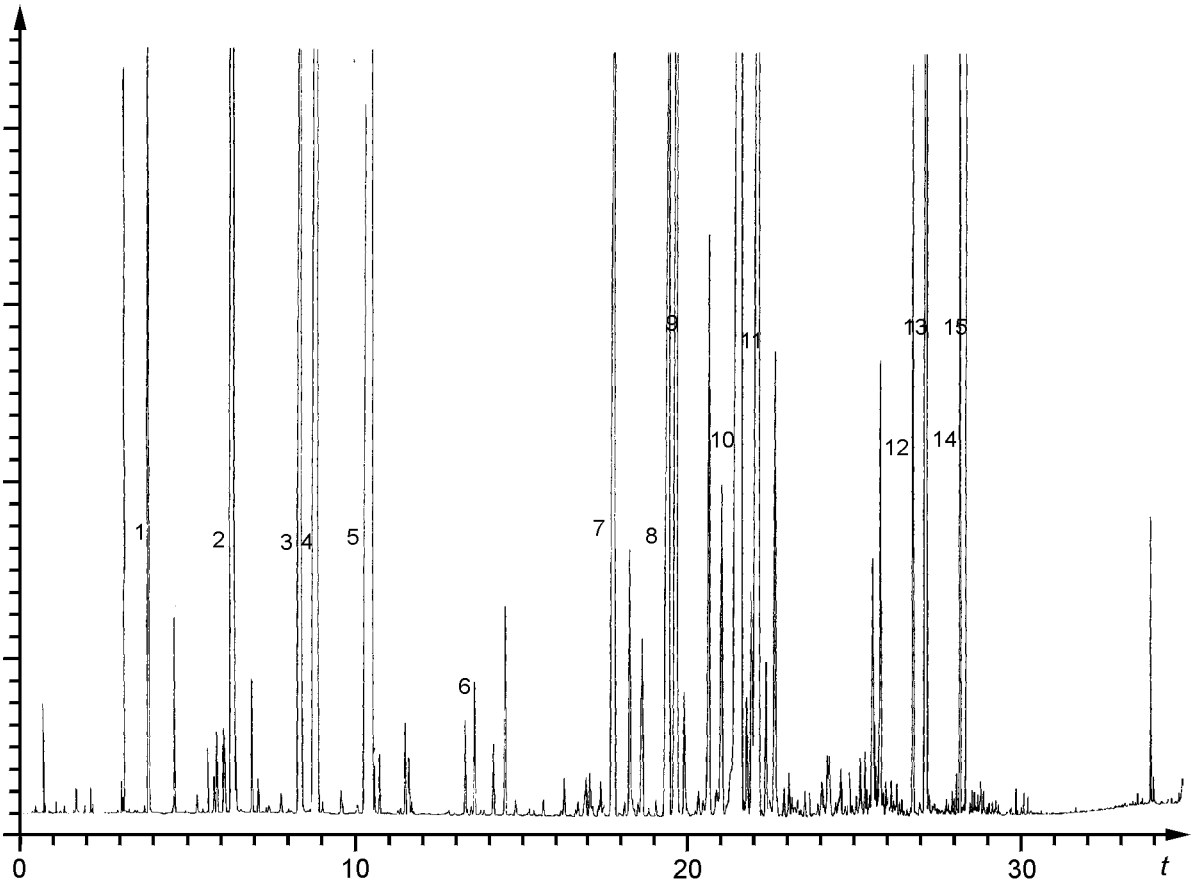
Component	Fractions								
	Extra super	Extra		First		Second		Third	
	Comores and Mayotte	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar
Prenyl acetate									
Min.	1,5	1,0	0,6	0,3	0,2	0,2	0,1	0,1	traces
Max.	3,2	2,3	2,2	1,8	1,0	0,9	0,5	0,2	0,2
***p*-Cresyl methyl ether**									
Min.	7,0	5,0	7,0	3,0	5,0	2,0	1,0	0,1	0,1
Max.	13,0	13,0	16,0	8,5	10,0	5,0	4,6	1,0	1,4
Methyl benzoate									
Min.	4,5	4,0	4,5	1,5	3,0	1,0	1,0	0,1	0,1
Max.	8,0	6,5	9,0	5,5	5,0	3,5	3,0	0,8	0,9
Linalool									
Min.	8,0	7,0	15,0	3,0	12,0	2,0	4,0	0,1	0,6
Max.	13,0	12,0	24,0	10,0	19,0	6,0	9,5	2,0	4,0
Benzyl acetate									
Min.	14,0	11,0	5,5	6,0	2,8	4,0	0,5	0,5	0,1
Max.	20,0	17,5	14,0	14,0	10,0	8,8	5,0	3,0	2,2
Geraniol									
Min.	0,1	0,1	1,3	0,1	1,6	0,1	0,7	traces	0,2
Max.	0,7	0,5	3,0	0,3	2,6	0,3	2,4	0,1	0,8
Geranyl acetate									
Min.	2,0	2,5	7,0	2,0	8,0	1,7	5,6	0,4	1,0
Max.	6,0	6,0	14,0	5,0	15,0	6,0	12,0	3,0	6,6
***E*-Cinnamyl acetate**									
Min.	4,0	3,0	0,5	2,2	0,5	2,0	0,4	0,5	0,1
Max.	6,0	6,5	3,0	5,0	2,0	4,8	2,2	2,5	2,0
β-Caryophyllene									
Min.	2,0	2,5	2,5	4,0	5,5	4,8	10,0	5,0	12,0
Max.	6,0	8,0	8,5	10,0	12,0	14,0	17,0	15,0	19,0
D-Germacrene									
Min.	9,0	14,0	5,0	10,0	9,5	16,0	13,0	20,0	15,0
Max.	15,0	20,0	15,0	24,0	18,0	28,0	28,0	35,0	34,0
(*E*,*E*)-α-Farnesene									
Min.	2,0	6,5	1,0	7,0	3,0	14,0	5,0	12,0	9,0
Max.	6,0	15,0	5,0	18,0	8,0	21,0	11,5	29,0	25,0

Table 2 (*continued*)

Component	Fractions								
	Extra super	Extra		First		Second		Third	
	Comores and Mayotte	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar	Comores and Mayotte	Mada-gascar
(*E*,*E*)-Farnesol									
Min.	0,8	0,8	0,5	0,8	0,1	0,8	1,2	0,8	1,2
Max.	1,5	1,6	3,0	2,0	2,5	3,0	3,5	3,0	4,0
Benzyl benzoate									
Min.	3,0	4,0	3,5	4,2	4,5	4,5	6,0	4,0	4,8
Max.	6,0	6,0	8,0	9,2	8,0	7,8	10,0	8,0	8,5
(*E*,*E*)- Farnesyl acetate									
Min.	1,0	1,0	0,5	1,0	1,0	1,0	1,2	1,5	1,7
Max.	3,0	3,0	3,0	4,0	2,0	3,5	3,5	5,0	5,0
Benzyl salicylate									
Min.	1,5	2,0	1,2	2,0	1,6	2,0	1,8	2,5	2,0
Max.	3,5	3,8	4,0	4,0	4,0	4,0	4,0	4,8	5,0

Annex A
(informative)

Typical chromatograms of the analysis by gas chromatography of oil of ylang-ylang [*Cananga odorata* (Lam.) Hook. f. et Thomson forma *genuina*]



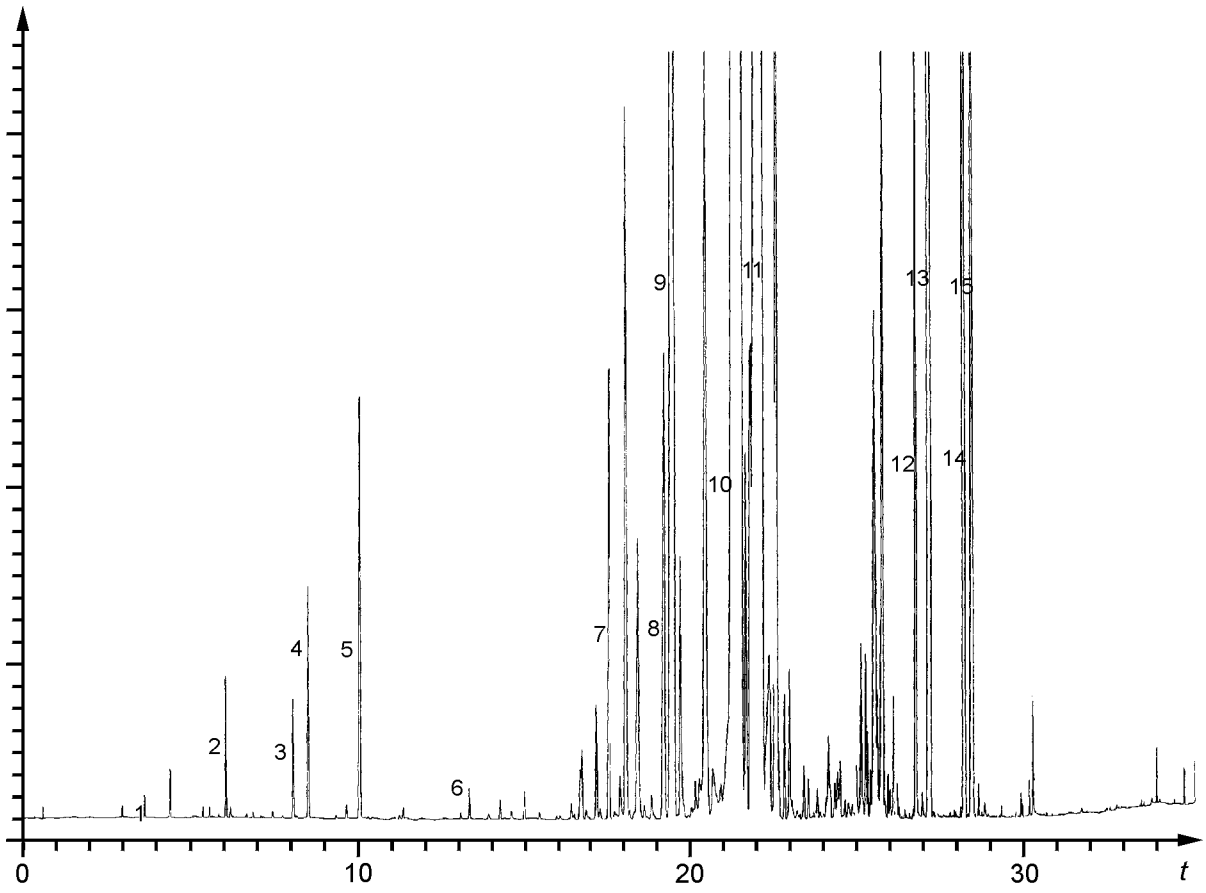
Peak identification

1	Prenyl acetate	9	β-Caryophyllene
2	*p*-Cresyl methyl ether	10	D-Germacrene
3	Methyl benzoate	11	(*E*,*E*)-α-Farnesene
4	Linalool	12	(*E*,*E*)-Farnesol
5	Benzyl acetate	13	Benzyl benzoate
6	Geraniol	14	(*E*,*E*)-Farnesyl acetate
7	Geranyl acetate	15	Benzyl salicylate
8	*E*-Cinnamyl acetate		

Operating conditions

Column: silica capillary, length 20 m, internal diameter 0,1 mm
Stationary phase: methyl siloxane
Film thickness: 0,40 µm
Oven temperature: isothermal at 80 °C for 2 min, then temperature programming from 80 °C to 170 °C at a rate of 4 °C/min, and from 170 °C to 305 °C at a rate of 15 °C/min, and isothermal at 305 °C for 2 min
Injector temperature: 260 °C
Detector temperature: 300 °C
Detector: flame ionization type
Carrier gas: hydrogen
Volume injected: 0,2 µl
Carrier gas flow rate: 0,6 ml/min
Split ratio: 1/120

Figure A.1 — Typical chromatogram of oil of ylang-ylang Extra Comores taken on an apolar column



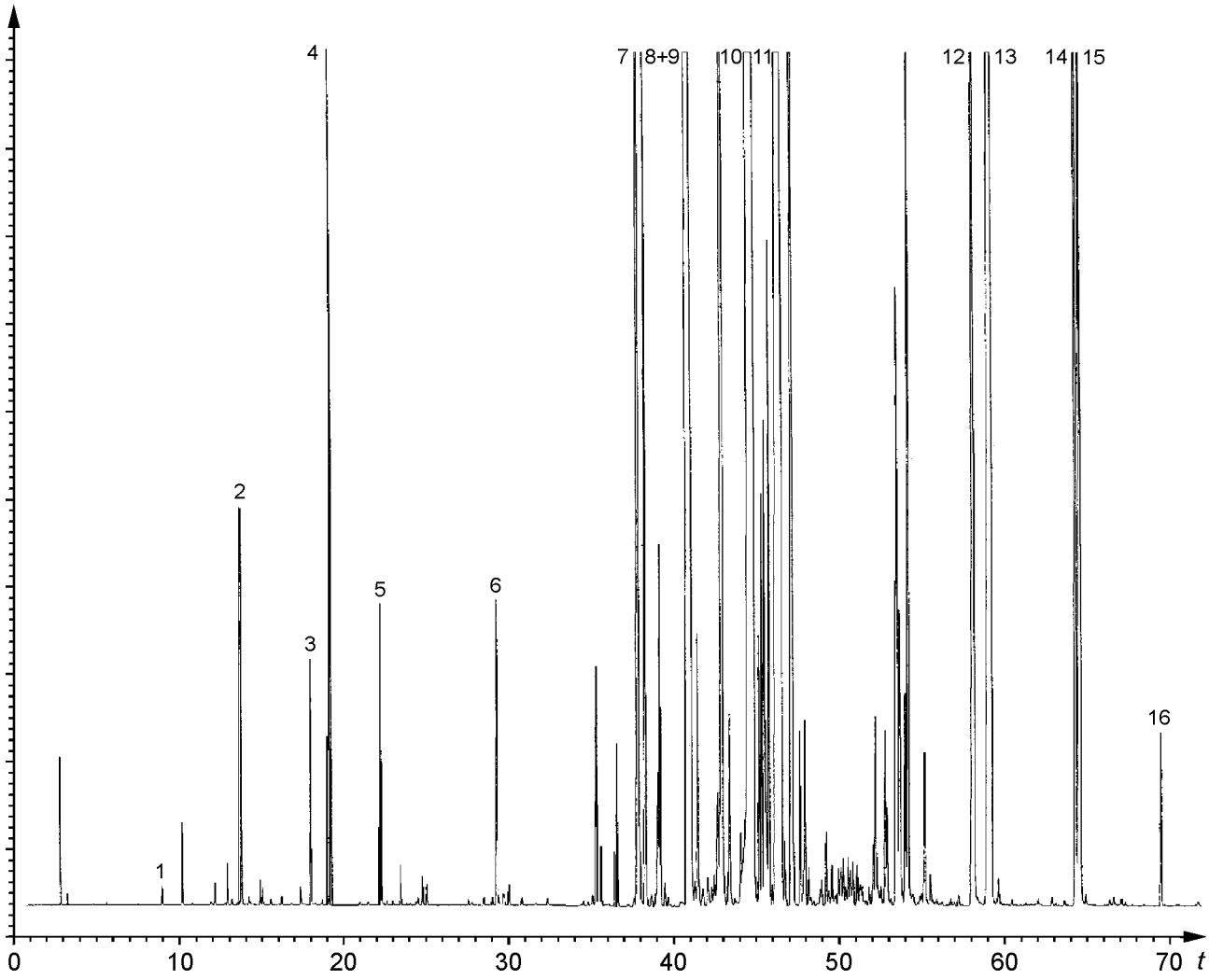
Peak identification

1	Prenyl acetate	9	β-Caryophyllene
2	*p*-Cresyl methyl ether	10	D-Germacrene
3	Methyl benzoate	11	(*E*,*E*)-α-Farnesene
4	Linalool	12	(*E*,*E*)-Farnesol
5	Benzyl acetate	13	Benzyl benzoate
6	Geraniol	14	(*E*,*E*)-Farnesyl acetate
7	Geranyl acetate	15	Benzyl salicylate
8	*E*-Cinnamyl acetate		

Operating conditions

Column: silica capillary, length 20 m, internal diameter 0,1 mm
Stationary phase: methyl siloxane
Film thickness: 0,40 µm
Oven temperature: isothermal at 80 °C for 2 min, then temperature programming from 80 °C to 170 °C at a rate of 4 °C/min, and from 170 °C to 305 °C at a rate of 15 °C/min, and isothermal at 305 °C for 2 min
Injector temperature: 260 °C
Detector temperature: 300 °C
Detector: flame ionization type
Carrier gas: hydrogen
Volume injected: 0,2 µl
Carrier gas flow rate: 0,6 ml/min
Split ratio: 1/120

Figure A.2 — Typical chromatogram of oil of ylang-ylang "Third" Comores taken on an apolar column



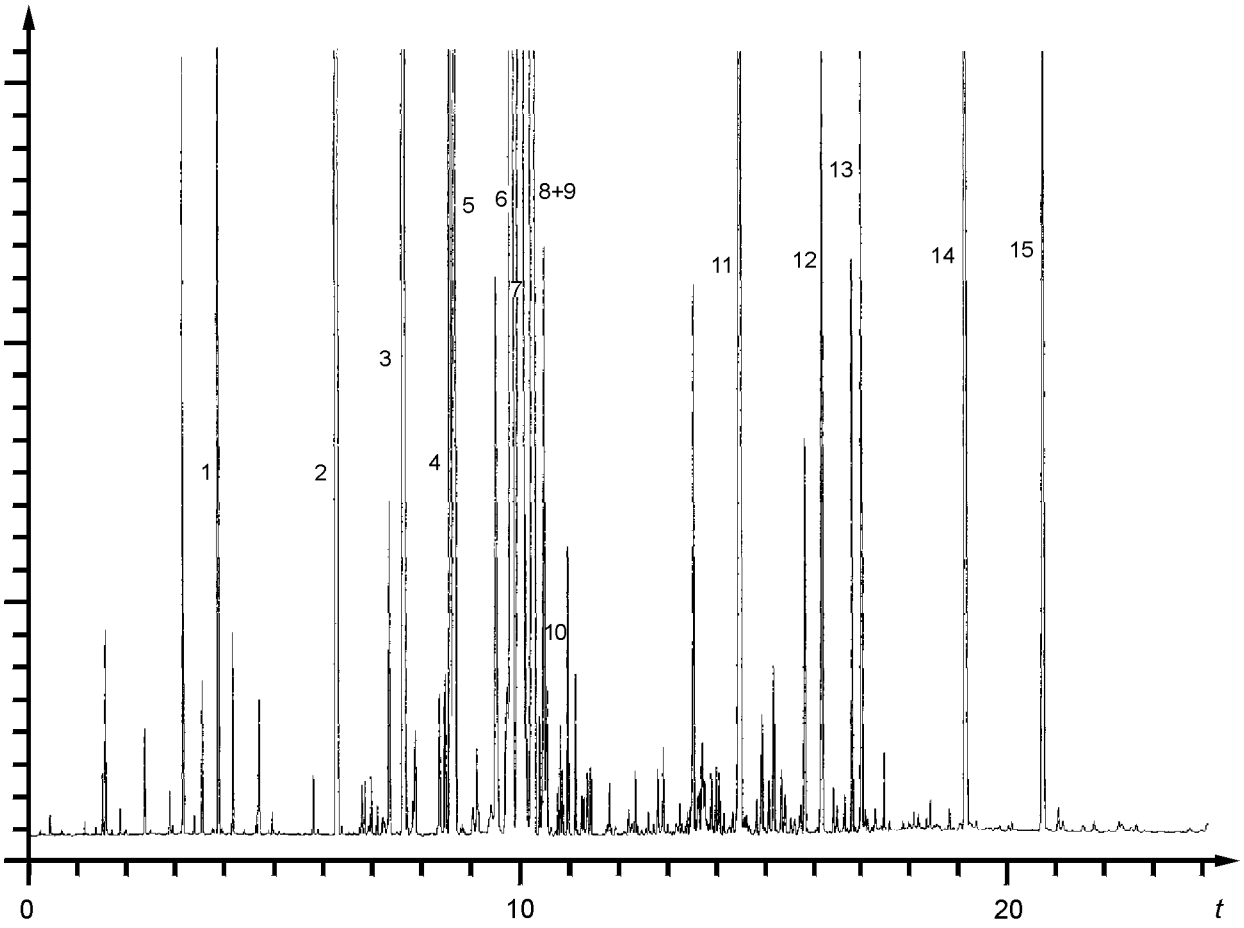
Peak identification

1	Prenyl acetate	9	β-Caryophyllene
2	*p*-Cresyl methyl ether	10	D-Germacrene
3	Methyl benzoate	11	(*E*,*E*)-α-Farnesene
4	Linalool	12	(*E*,*E*)-Farnesol
5	Benzyl acetate	13	Benzyl benzoate
6	Geraniol	14	(*E*,*E*)-Farnesyl acetate
7	Geranyl acetate	15	Benzyl salicylate
8	*E*-Cinnamyl acetate	16	Geranyl benzoate

Operating conditions

Column: capillary, length 50 m, internal diameter 0,2 mm
Stationary phase: poly (dimethyl siloxane)
Film thickness: 0,25 µm
Oven temperature: programme of temperature from 65 °C to 230 °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 µl
Carrier gas flow rate: 1,1 ml/min
Split ratio: 1/100

Figure A.3 — Typical chromatogram of oil of ylang-ylang "Third" Madagascar taken on an apolar column



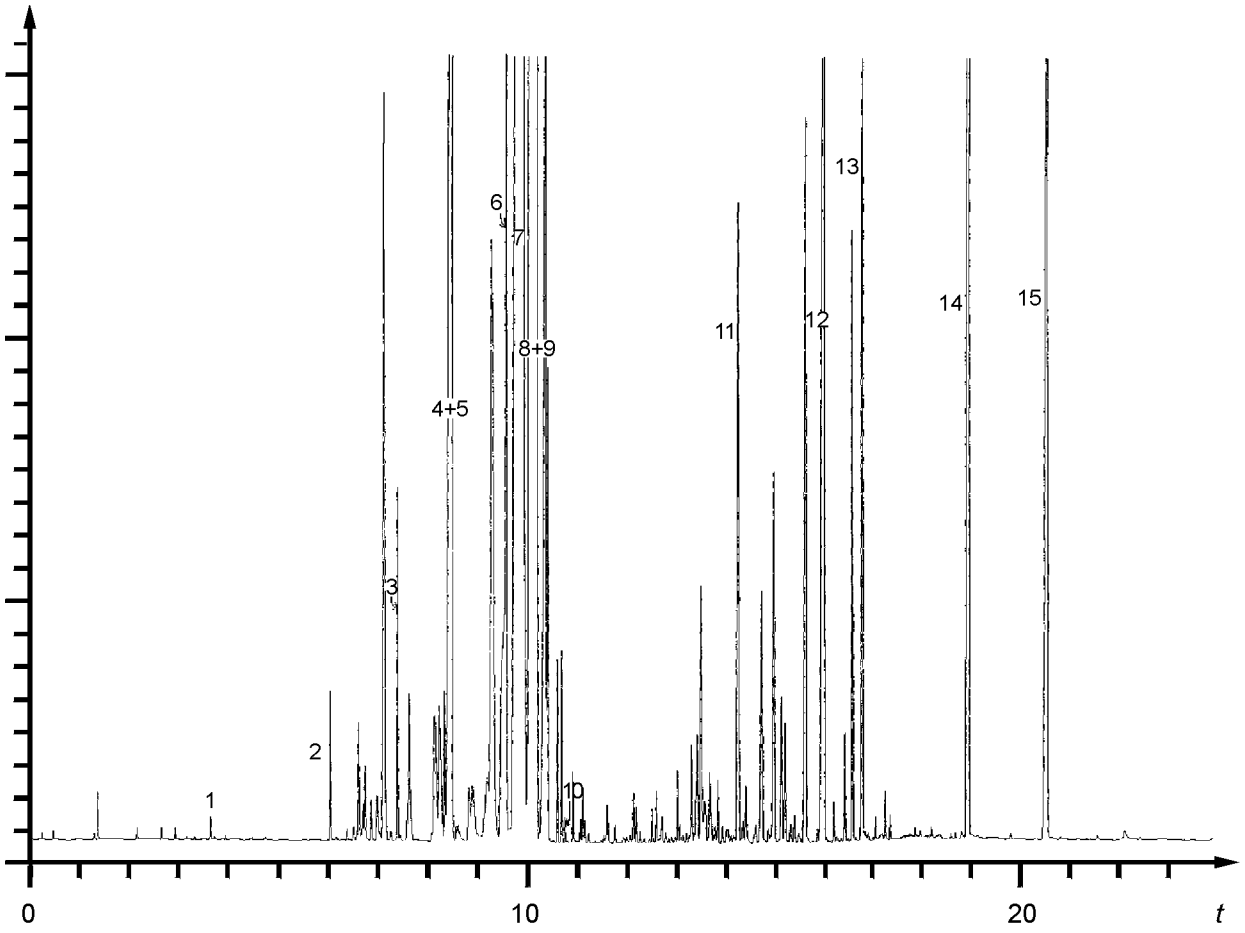
Peak identification

1	Prenyl acetate	9	(*E*,*E*)-α-Farnesene
2	*p*-Cresyl methyl ether	10	Geraniol
3	Linalool	11	*E*-Cinnamyl acetate
4	Methyl benzoate	12	(*E*,*E*)-Farnesyl acetate
5	β-Caryophyllene	13	(*E*,*E*)-Farnesol
6	Benzyl acetate	14	Benzyl benzoate
7	D-Germacrene	15	Benzyl salicylate
8	Geranyl acetate		

Operating conditions

Column: silica, capillary, length 20 m, internal diameter 0,1 mm
Stationary phase: bonded polyethylene glycol
Film thickness: 0,20 µm
Oven temperature: isothermal at 65 °C for 1 min, then temperature programming from 65 °C to 190 °C at a rate of 10 °C/min, and isothermal 190 °C for 2 min, and from 190 °C to 240 °C, at a rate of 20 °C/min, and isothermal 240 °C for 6 min
Injector temperature: 250 °C
Detector temperature: 280 °C
Detector: flame ionization type
Carrier gas: hydrogen
Volume injected: 0,2 µl
Carrier gas flow rate: 0,4 ml/min
Split ratio: 1/150

Figure A.4 — Typical chromatogram of oil of ylang-ylang Extra Comores taken on a polar column



Peak identification

1	Prenyl acetate	9	(*E*,*E*)-α-Farnesene
2	*p*-Cresyl methyl ether	10	Geraniol
3	Linalool	11	*E*-Cinnamyl acetate
4	Methyl benzoate	12	(*E*,*E*)-Farnesyl acetate
5	β-Caryophyllene	13	(*E*,*E*)-Farnesol
6	Benzyl acetate	14	Benzyl benzoate
7	D-Germacrene	15	Benzyl salicylate
8	Geranyl acetate		

Operating conditions

Column: silica, capillary, length 20 m, internal diameter 0,1 mm
Stationary phase: bonded polyethylene glycol
Film thickness: 0,20 µm
Oven temperature: isothermal at 65 °C for 1 min, then temperature programming from 65 °C to 190 °C at a rate of 10 °C/min, and isothermal 190 °C for 2 min, and from 190 °C to 240 °C, at a rate of 20 °C/min, and isothermal 240 °C for 6 min
Injector temperature: 250 °C
Detector temperature: 280 °C
Detector: flame ionization type
Carrier gas: hydrogen
Volume injected: 0,2 µl
Carrier gas flow rate: 0,4 ml/min
Split ratio: 1/150

Figure A.5 — Typical chromatogram of oil of ylang-ylang "Third" Comores taken on a polar column

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 flashpoints 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 wide variation in the chemical composition of essential oils;

— the volume of the sample needed for 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 in an informative annex to each International Standard in order to meet the requirements of the interested parties.

The equipment with which this value was obtained should be specified.

For further information see ISO/TR 11018.

B.2 Flashpoint of oil of ylang-ylang

B.2.1 The mean value is

— 78 °C for the Extra super fraction,

— 81 °C for the Extra fraction,

— 89 °C for the First fraction,

— 95 °C for the Second fraction, and

— 101 °C for the Third fraction.

NOTE Values obtained with “Luchaire” equipment.

B.2.2 The mean value is

— 78 °C for the Extra super fraction,

— 81 °C for the Extra fraction,

— 87 °C for the First fraction,

— 93 °C for the Second fraction, and

— 101 °C for the Third fraction.

NOTE Values obtained with “Pensky-Martens” equipment.

Bibliography

[1] ISO/TR 11018:1997, *Essential oils — General guidance on the determination of flashpoint*

[2] ISO/TR 21092:2004, *Essential oils — Characterization*

blank

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001. Email: orders@bsi-global.com. Standards are also available from the BSI website at http://www.bsi-global.com.

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact the Information Centre. Tel: +44 (0)20 8996 7111. Fax: +44 (0)20 8996 7048. Email: info@bsi-global.com.

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002. Fax: +44 (0)20 8996 7001. Email: membership@bsi-global.com.

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsi-global.com/bsonline.

Further information about BSI is available on the BSI website at http://www.bsi-global.com.

Copyright

BSI
389 Chiswick High Road
London
W4 4AL