INTERNATIONAL STANDARD

ISO 4725

Second edition
2004-05-15

Oil of cedarwood, Texas (*Juniperus mexicana* Schiede)

*Huile essentielle de bois de cèdre, Texas (*Juniperus mexicana *Schiede)*

Reference number
ISO 4725:2004(E)

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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 4725 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

This second edition cancels and replaces the first edition (ISO 4725:1986), which has been technically revised.

Oil of cedarwood, Texas (*Juniperus mexicana* Schiede)

1 Scope

This International Standard specifies certain characteristics of the oil of cedarwood, Texas (*Juniperus mexicana* Schiede), 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 3794, *Essential oils (containing tertiary alcohols) — Estimation of free alcohols content by determination of ester value after acetylation*

ISO 7660, *Essential oils — Determination of ester value of oils containing difficult-to-saponify esters*

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 cedarwood, Texas
essential oil obtained by steam distillation of the wood of *Juniperus mexicana* Schiede, from the west of North America and Central America, of the Cupressaceae family

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

4 Requirements

4.1 Appearance

Viscous liquid.

4.2 Colour

Brown to reddish brown.

4.3 Odour

Characteristic, woody.

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

Minimum: 0,950

Maximum: 0,966

4.5 Refractive index at 20 °C

Minimum: 1,502

Maximum: 1,510

4.6 Optical rotation at 20 °C

Between −52° and −30°

4.7 Miscibility in ethanol, 90 % (volume fraction), at 20 °C

It shall not be necessary to use more than 5 volumes of ethanol, 90 % (volume fraction), to obtain a clear solution with 1 volume of essential oil.

4.8 Content of alcohols, expressed as cedrol

Minimum: 35 % (volume fraction)

Maximum: 48 % (volume fraction)

4.9 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

Component	Minimum %	Maximum %
α-Cedrene	15,0	25,0
β-Cedrene	3,0	8,0
Thujopsene	25,0	35,0
Cuparene	1,5	3,2
Cedrol	20,0	—
Widdrol	2,5	—
NOTE The chromatographic profile is normative, contrary to typical chromatograms given for information in Annex A.		

4.10 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 Miscibility in ethanol, 90 % (volume fraction), at 20 °C

See ISO 875.

6.5 Content of alcohols, expressed as cedrol

See ISO 3794.

Saponification shall be carried out according to ISO 7660.

6.6 Chromatographic profile

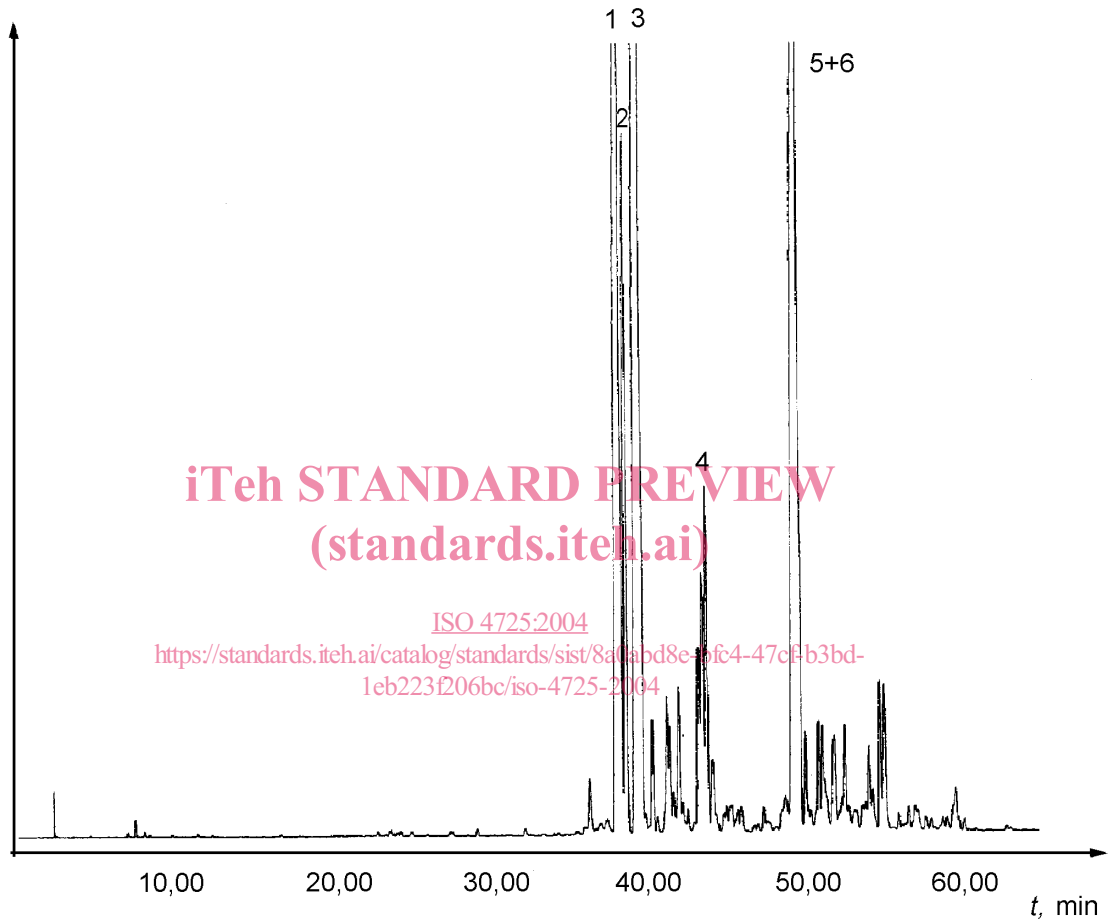
See ISO 11024-1 and ISO 11024-2.

7 Packaging, labelling, marking and storage

See ISO/TR 210 and ISO/TR 211.

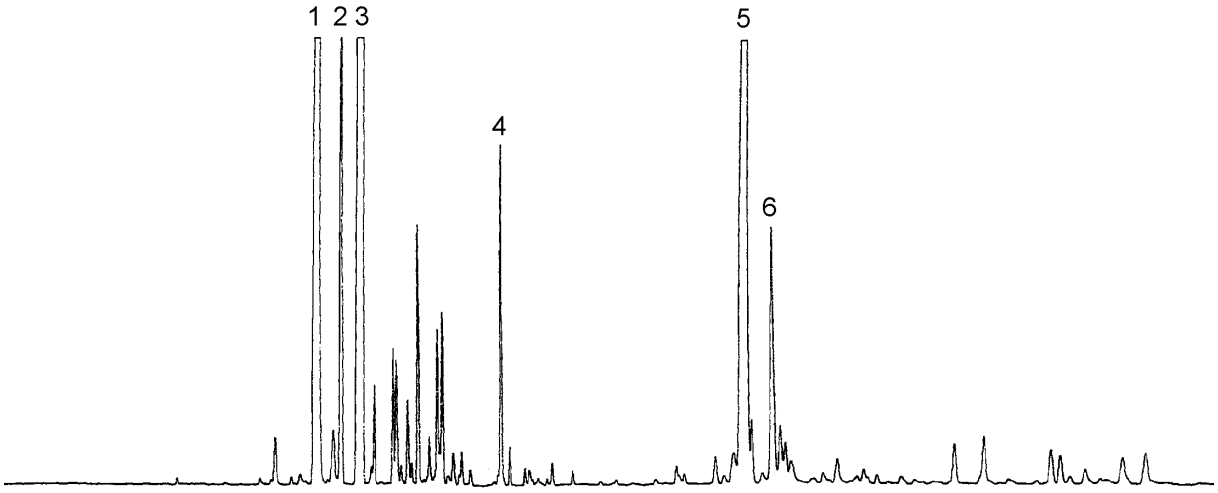
Annex A
(informative)

Typical chromatogram of the analysis by gas chromatography of the essential oil of cedarwood, Texas (*Juniperus mexicana* Schiede)



Peak identification		Operating conditions
1	α-Cedrene	Column: silica capillary; length 30 m; internal diameter 320 µm
2	β-Cedrene	Stationary phase: poly(dimethyl siloxane) (HP-5®)
3	Thujopsene	Film thickness: 0,25 µm
4	Cuparene	Oven temperature: isothermal at 70 °C for 10 min, then programming from 70 °C to 220 °C, at a rate of 2 °C/min
5	Cedrol	Injector temperature: 250 °C
6	Widdrol	Detector temperature: 250 °C
		Detector: flame ionization type
		Carrier gas: nitrogen
		Volume injected: 0,2 µl
		Carrier gas flow rate: 1 ml/min
		Split ratio: 1/100

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



Peak identification		Operating conditions
1	α-Cedrene	Column: silica capillary; length 20 m; internal diameter100 µm
2	β-Cedrene	Stationary phase: poly(ethylene glycol) (Carbowax-20 M®)
3	Thujopsene	Film thickness: 0,25 µm
4	Cuparene	Oven temperature: isothermal at 50 °C for 1 min, then programming from 50 °C to 200 °C, at a rate of 10 °C/min
5	Cedrol	Injector temperature: 250 °C
6	Widdrol	Detector temperature: 250 °C
		Detector: flame ionization type
		Carrier gas: hydrogen
		Volume injected: 0,2 µl
		Carrier gas flow rate: 0,3 ml/min
		Pressure programming: start at 220,68 kPa for 20 min, then increasing at 34,48 kPa/min up to 310,34 kPa, then 310,34 kPa for 20 min

Figure A.2 — Typical chromatogram 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 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 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 the essential oil of cedarwood, Texas

The mean value is +107 °C.

NOTE Obtained with “Luchaire” equipment.