
International Standard



7356

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Oil of thujone-containing artemisia and oil of sage (*Salvia officinalis* Linnaeus) — Determination of α - and β -thujone content — Gas chromatographic method on packed columns

*Huiles essentielles d'artémisia à thujone et de sauge (*Salvia officinalis* Linnaeus) — Détermination de la teneur en α - et β -thujone — Méthode par chromatographie en phase gazeuse sur colonne remplie*

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[ISO 7356:1985](#)

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Ref. No. ISO 7356-1985 (E)

Descriptors: essential oils, sage, chemical analysis, determination of content, gas chromatography.

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7356 was prepared by Technical Committee ISO/TC 54, *Essential oils*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Oil of thujone-containing artemisia and oil of sage (*Salvia officinalis* Linnaeus) — Determination of α - and β -thujone content — Gas chromatographic method on packed columns

0 Introduction

Since the description of methods of analysis by gas chromatography is very long, it is considered useful to establish general methods on the one hand, giving detailed information on all the recurrent parameters, apparatus, products, methods, formulae, etc., and on the other hand standards with short details on the determination of specific constituents in the essential oils, giving only those operating conditions specific to the pertinent determination.

This is the case with the present International Standard, which refers to the general standard ISO 7359 for the general paragraphs.

1 Scope and field of application

This International Standard specifies a gas chromatographic method on packed columns for the determination of the α - and β -thujone content of oil of thujone-containing artemisia and oil of sage (*Salvia officinalis* Linnaeus).

2 References

ISO 356, *Essential oils — Preparation of test sample*.

ISO 7359, *Essential oils — Analysis by gas chromatography on packed columns — General method*.

3 Principle

Analysis by chromatography, under specified conditions, of small quantities of oils of artemisia or sage on a packed column. Determination of the α - and β -thujone content using the internal standard or addition method.

4 Reagents and products

4.1 Reference substance: thujone (mixture of α - and β -isomers), freshly distilled, of purity at least 95 % (sum of percentages for peaks of α - and β -isomers), determined by chromatography under the test conditions.

4.2 Internal standard: choose from the following products, freshly distilled¹⁾: methyl octanoate, methyl decanoate or *n*-pentadecane, of purity at least 95 %, determined by chromatography under the test conditions.

5 Apparatus

5.1 Chromatograph, recorder and integrator.

See ISO 7359.

5.2 Column, of length 3 to 4 m and internal diameter 2 to 4 mm. Stationary phase: cyanopropyl methylphenyl methyl silicone, or trifluoropropylmethyl silicone, or polyethylene glycol 1 500.

5.3 Detector, flame ionization or thermal conductivity type.

6 Preparation of test sample

See ISO 356.

7 Operating conditions

7.1 Temperatures

- Oven:
 - isotherm about 100 °C when using cyanopropyl methylphenyl methyl silicone or trifluoropropylmethyl silicone;
 - isotherm about 130 °C when using polyethylene glycol 1 500.
- Injection system:
 - about 170 °C.
- Detector:
 - about 170 °C.

1) The internal standard chosen shall elute as near as possible to the constituent(s) to be determined and shall not superimpose on the peaks of any of the constituents of the essential oil.

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7.2 Carrier gas and auxiliary gases flow rates

See ISO 7359.

8 Column performance

8.1 Chemical inertness test

Carry out the test as specified in ISO 7359.

8.2 Column efficiency

Determine the column efficiency as specified in ISO 7359.

9 Determination of retention indexes

See ISO 7359.

10 Methods of determination

Assume for the calibration and for the determination that α - and β -thujone have the same response factor K relative to the internal standard.

10.1 Determination of response factor (standards.iteh.ai)

Determine the response factor as specified in ISO 7359, using the thujone (4.1) as the reference substance and one of the internal standards (4.2).

In this case, for the calculation of the response factor K , A_R is the sum of the areas of the peaks for α - and β -thujone.

10.2 Internal standard method

Carry out the determination of the α - and β -thujone content of the essential oil as specified in ISO 7359.

10.3 Addition method

If the internal standard interferes with one of the peaks of the chromatogram of the essential oil, use the addition method as specified in ISO 7359.

In this case, A_X is the sum of the areas of the peaks for α - and β -thujone in chromatogram "D", and A'_X is the sum of the areas of the peaks for α - and β -thujone in chromatogram "E".

11 Expression of results

See ISO 7359.

In this case, A_X is the sum of the areas of the peaks for α - and β -thujone.

NOTE — Typical chromatograms are given, for information only, in the annex.

12 Test report

See ISO 7359.

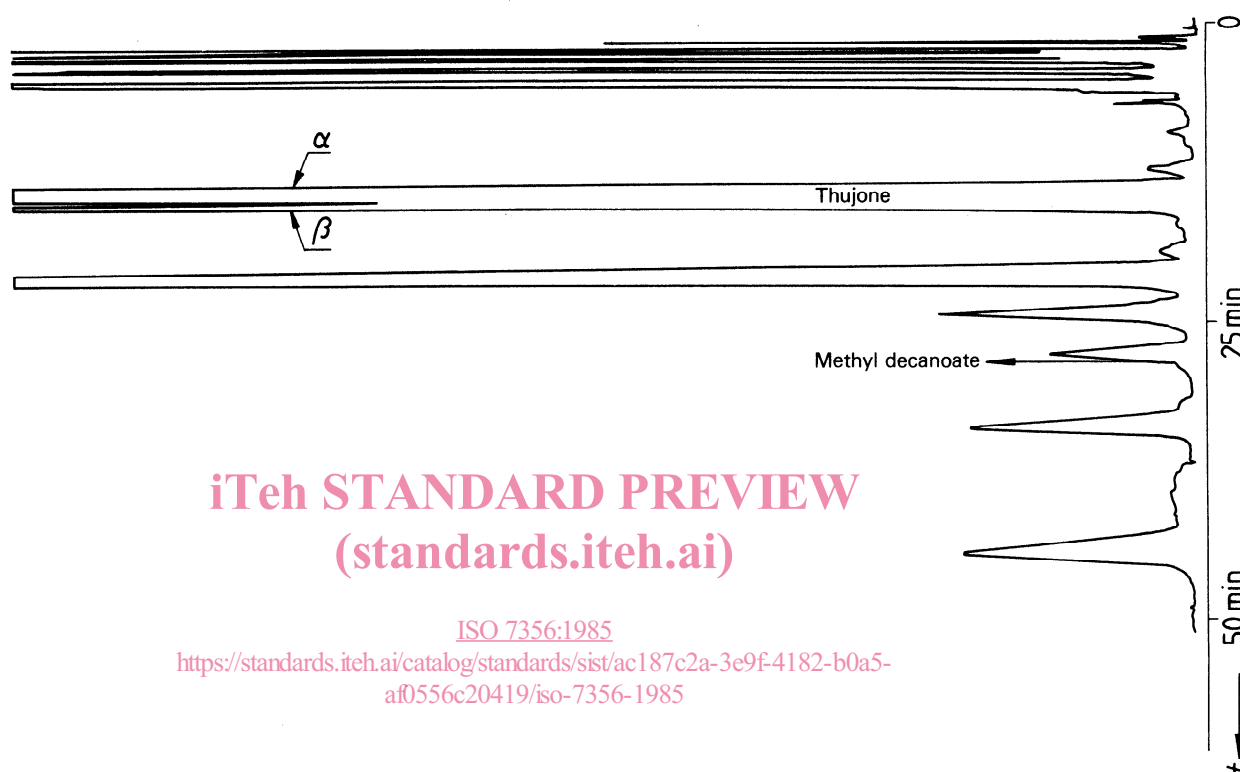
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Annex

Typical chromatograms

(This annex does not form an integral part of the Standard.)



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Sample: *Salvia officinalis* Linnaeus

Date: May 1985

Column: Glass

Size: 3 m

Support: 3 % Cyanopropyl methylphenyl methyl silicone on Chromosorb WHP

Mesh: 100 to 120 mesh

Column temperature: 100 °C, isothermal

Injection temperature: 170 °C

Detection temperature: 170 °C

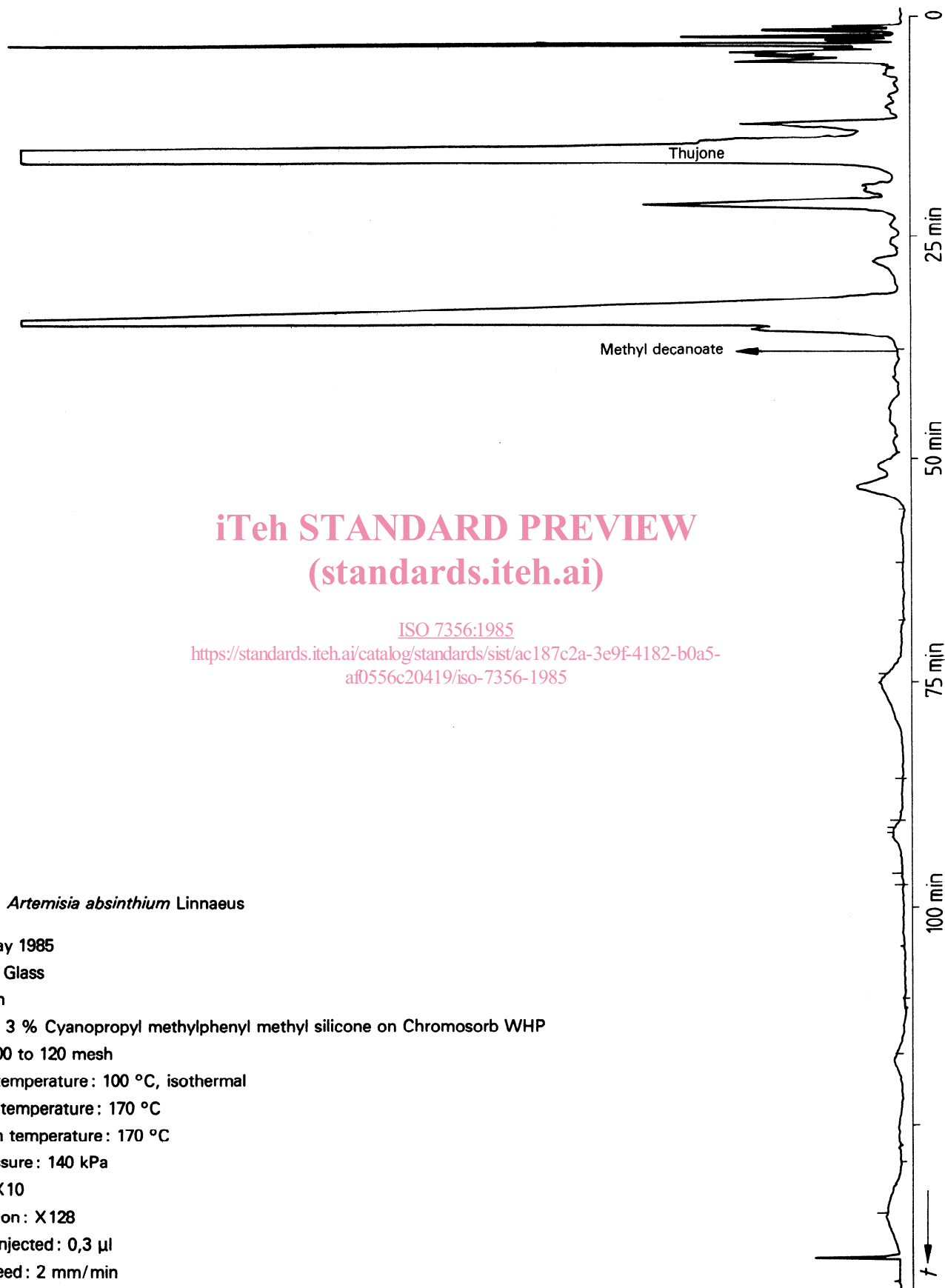
Inlet pressure: 140 kPa

Range: X10

Attenuation: X128

Volume injected: 0,3 μ l

Chart speed: 2 mm/min



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Sample: *Artemisia absinthium* Linnaeus

Date: May 1985

Column: Glass

Size: 3 m

Support: 3 % Cyanopropyl methylphenyl methyl silicone on Chromosorb WHP

Mesh: 100 to 120 mesh

Column temperature: 100 °C, isothermal

Injection temperature: 170 °C

Detection temperature: 170 °C

Inlet pressure: 140 kPa

Range: X10

Attenuation: X128

Volume injected: 0,3 µl

Chart speed: 2 mm/min

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