IS 3146 (1991): Oil of Celery Seed [PCD 18: Natural and Synthetic Fragrance Materials]

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IS 3146 : 1991

(Reaffirmed 2002)

भारतीय मानक

अजवायन के बीजों का तेल — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

OIL OF CELERY SEED — SPECIFICATION

(First Revision)

UDC 665·526·892

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 2

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Natural and Synthetic Perfumery Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Ajamoda, *Apium graveolens* Linn., fam. *Umbelliferae*, the common celery, is a hapaxanthic herb, grown as a biennial, and under certain conditions, as an annual. The celery plant, a native of *Eurasia*, is widely cultivated and raised mainly for its seed as an important crop in the foothills of the North-Western Himalayas, outlying hills in the Punjab and Uttar Pradesh in India. The bleached leaf stalks of the plant are relished as a popular vegetable while the small, mature fruit (or seeds, as it is commercially called), consisting of an ovate dark brown *cremocarp* and possessing an aromatic odour and somewhat pungent taste, is employed as a condiment. The essential oil distilled from celery seed, yield varying from 2 to 3 percent, is used extensively for flavouring of different kinds of food products, such as meats, soups, sauces, pickles, etc. In the indigenous systems of medicine, oil of celery seed is understood to have a sedative effect upon the central nervous system and is consequently used in nerve tonics.

In the formulation of this standard, assistance has been derived from EOA No. 85 'Specification for oil celery seed', Essential Oil Association of U.S.A. 1975 and ISO 3760 : 78 'Oil of celery seed' published by ISO/TC 54 Essential Oils, International Organization for Standardization (ISO).

In this revision gas chromatographic method of analysis is being included for guidance only under Annex A. Other necessary charges in requirement limits of refractive index, relative density, optical rotation and acid value have also been carried out.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

OIL OF CELERY SEED — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for oil of celery seed.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard.

IS No.	*Title*
326	Methods of sampling and test for natural and synthetic perfumery materials:
(Part 1) : 1984	Sampling (*second revision*)
(Part 2) : 1980	Preliminary examination of perfumery materials and samples (*second revision*)
(Part 3) : 1980	Relative density (*second revision*)
(Part 4) : 1980	Determination of optical rotation (*second revision*)
(Part 5) : 1986	Determination of refractive index (*second revision*)
(Part 6) : 1986	Determination of solubility in ethanol (*second revision*)
(Part 7) : 1980	Determination of acid value (*second revision*)
(Part 8) : 1980	Determination of ester value, content of esters and combined alcohol (*second revision*)
1070 : 1977	Water for general laboratory use (*second revision*)
2284 : 1988	Methods for olfactory assessment of natural and synthetic perfumery materials (*first revision*)
6597 : 1988	Glossary of terms relating to natural and synthetic perfumery materials (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, definition given in IS 6597 : 1988 shall apply.

4 REQUIREMENTS

4.1 Description

4.1.1 Oil of celery seed shall be obtained by steam distillation of the crushed and mature seeds of the plant *Apium graveolens* Linn, belonging to fam. *Umbelliferae*.

4.1.2 The oil shall be a clear liquid, free from sediment, suspended matter, separated water and adulterants.

4.2 The material shall also be tested olfactorily and especially for by-notes as prescribed in IS 2284 : 1988.

4.3 Solubility

The oil shall be soluble in 10 volumes of ethyl alcohol (90 percent by volume) when tested as prescribed in IS 326 (Part 6) : 1986.

4.4 The material shall also comply with the requirements given in Table 1.

5 PACKING AND MARKING

5.1 Packing

The material shall be supplied in well-closed containers, permitting a minimum of air-space as agreed to between the purchaser and the supplier.

5.1.1 The material shall be protected from light and stored in a cool place.

5.2 Marking

Each container so filled shall bear legibly and indelibly the following information:

a) Name of the material,

b) Indication of the source of manufacture,

c) Batch number and date of manufacture, and

d) Net and gross mass.

5.2.1 The container may also be marked with the Standard Mark.

6 SAMPLING

6.1 Representative samples of the material, shall be drawn as prescribed in IS 326 (Part 1) : 1984.

6.2 All the characteristics given in the specification shall be tested on the composite sample. The lot shall be declared as conforming to the requirements of this specification, if all the test results on the composite sample meet the relevant specification requirements.

Table 1 Requirements for Oil of Celery Seed
(*Clauses* 4.4 *and* 7.1)

Sl No.	Characteristic	Requirement	Methods of Test, Ref to
(1)	(2)	(3)	(4)
i)	Colour and appearance	Pale yellow to light brown liquid, sometimes pale greenish	IS 326 (Part 2) : 1980
ii)	Odour	Very persistent and spicy, pleasing odour, typical of celery seed	IS 2284 : 1988
iii)	Relative density at 27°C	0·871 0 to 0·910 0	IS 326 (Part 3) : 1980
iv)	Optical rotation	+50° to +80°	IS 326 (Part 4) : 1980
v)	Refractive index at 27°C	1·476 5 to 1·486 5	IS 326 (Part 5) : 1980
vi)	Acid value, *Max* (using 10 g of sample)	3·5	IS 326 (Part 7) : 1980
vii)	Saponification value, *Min* (using 4 to 5 g of sample)	35	IS 326 (Part 8) : 1980

7 TESTS

7.1 Tests shall be conduted as prescribed in **4.1** to **4.3** and in col 4 of Table 1.

7.2 Quality Reagents

Unless otherwise specified pure chemicals and distilled water (*see* IS 1070 : 1977) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A
(*Foreword*)
GAS CHROMATOGRAPHIC ANALYSIS FOR OIL OF CELERY SEED

A-0 GENERAL

A-0.1 The chromatographic conditions given here are for guidance only.

A-0.2 Outline of the Method

A sample of the material is dissolved in suitable solvent (for example, ethyl acetate, hexane, cyclohexane and chlorocarbon) and is injected into the gas chromatograph where it is carried by the carrier gas from one end of the column to the other. During its movement, the constituents of the sample undergo distribution at different rates and ultimately get separated from one another. The separated constituents emerge from the end of the column one after another and are detected by suitable means whose response is related to the amount of a specific component leaving the column.

A-1 APPARATUS

A-1.1 Any gas chromatograph capable of being operated under conditions suitable for resolving the individual constituents into distinct peaks may be used. The typical chromatogram for oil of celery seed using a chromatograph with the following chromatographic conditions is shown in Fig. 1.

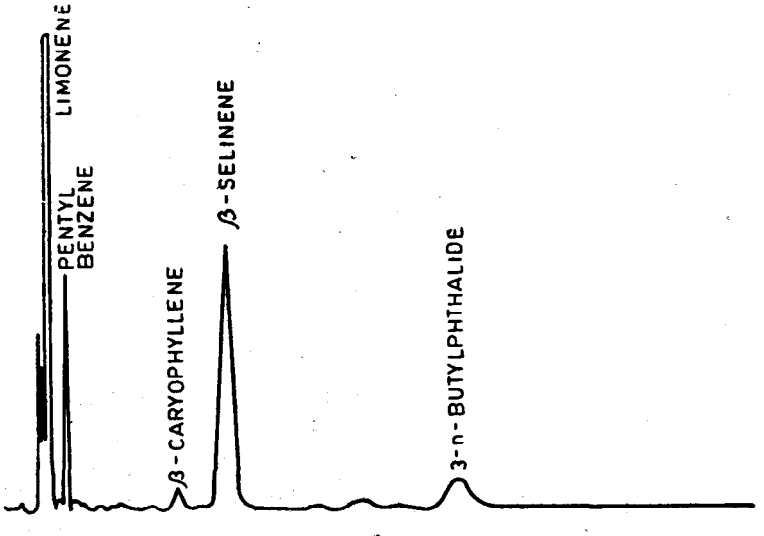

FIG. 1 A TYPICAL CHROMATOGRAM FOR OIL OF CELERY SEED

Column

Material	:	Stainless Steel
Length	:	1·47 m
Stationary phase	:	FFAP*, 10 percent by mass
Solid support	:	SE — 30 (80 — 100 W.H.P.)
Carrier Gas		Nitrogen

Conditions

Column temperature	:	175°C
Injection port temperature	:	250°C

Detector

Type	:	F.I.D.
Temperature	:	250°C

A-2 CALCULATION

A-2.1 Area Measurements (*see* Note 1)

Since normal peaks approximate a triangle, the area is measured by multiplying the peak height times the width of half height. The normal peak base is not taken since large deviations may be observed due to tailing or adsorption. This technique is rapid, simple and fairly accurate when peaks are symmetrical and of reasonable width.

*Free fatty acid (FFAP) in carbowax 20 M treated with nitrophthalic acid.

A-2.2 Area Normalization (*see* Note 2)

By normalizing, it is meant calculating percentage composition by measuring the area of each and dividing the individual areas by total area, for example:

$$\text{Percentage of } A = \frac{\text{Area of } A}{\text{Total area}} \times 100$$

NOTES

1 Other methods of area measurements, namely, triangulation, disc integrator and electronic digital integrator, if fixed with GLC machine, would be of great advantage.

2 Internal standardization can be used if pure appropriate internal standard is available. This method is known as relative or indirect calibration.

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