

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 280

DETERMINATION OF THE REFRACTIVE INDEX OF ESSENTIAL OILS

1st EDITION
November 1962

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Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 280, *Determination of the Refractive Index of Essential Oils*, was drawn up by Technical Committee ISO/TC 54, *Essential Oils*, the Secretariat of which is held by the Repartição de Normalização (IGPAI).

Work on this question by the Technical Committee began in 1953 and led, in 1957, to the adoption of a Draft ISO Recommendation.

This first Draft ISO Recommendation (No. 88) was circulated to all the ISO Member Bodies for enquiry. As the results of this consultation were not considered satisfactory, the Technical Committee presented a second Draft ISO Recommendation, which was circulated to all the Member Bodies in April 1960 and was approved by the following Member Bodies:

Australia	France	New Zealand
Austria	Greece	Portugal
Belgium	Israel	Romania
Burma	Italy	Spain
Canada	Japan	Sweden
Chile	Mexico	United Kingdom
Czechoslovakia	Netherlands	U.S.S.R.
		Yugoslavia

One Member Body opposed the approval of the Draft: India.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1962, to accept it as an ISO RECOMMENDATION.

DETERMINATION OF THE REFRACTIVE INDEX OF ESSENTIAL OILS

1. SCOPE

This ISO Recommendation specifies the method to be used in determining the refractive index of essential oils.

2. DEFINITION

The *refractive index* of an essential oil means the ratio of the sine of the angle of incidence to the sine of the angle of refraction, when a ray of light of defined wave length passes from air into the essential oil kept at a constant temperature.

The wave length is 589.3 ± 0.3 nm (nanometre) corresponding with the D_1 and D_2 lines of the sodium spectrum.

The reference temperature is 20 °C, except for those oils which are not liquid at this temperature. In this case, a temperature of 25 °C or 30 °C, depending on the melting point of these essential oils, should be used.

3. PRINCIPLE OF METHOD

According to the type of instrument used, the method is based either on the direct measurement of the angle of refraction or on the observation of the limit of total reflection, the oil being maintained under conditions of isotropism and transparency.

4. APPARATUS

4.1 Refractometers

A recognized type of refractometer is used, allowing direct readings of refractive indices between 1.3000 and 1.7000 to be made with an accuracy of ± 0.0002 .

Adjust the apparatus so as to give at 20 °C the following refractive indices:

- 1.3330 for distilled water,
- 1.3651 for ethanol, 85 per cent by mass,
- 1.4906 for *p*-cymene,
- 1.6043 for benzyl cinnamate,
- 1.5685 for benzyl benzoate, and
- 1.6585 for 1-bromonaphthalene.

Some instruments may also be adjusted by means of a plate of glass of known refractive index, according to the directions supplied by the manufacturer of the instrument.

4.2 Apparatus for temperature maintenance

Any apparatus may be used which ensures a circulation of water through the refractometer, thus keeping the instrument at the necessary temperature (± 0.2 °C).

4.3 Light source

The determinations are made using sodium light. Diffused daylight or light from an electric lamp may be used for refractometers fitted with an achromatic compensator.