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# International Standard



# 592

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## Essential oils — Determination of optical rotation

*Huiles essentielles — Détermination du pouvoir rotatoire*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 592 was developed by Technical Committee ISO/TC 54, *Essential oils*, and was circulated to the member bodies in November 1979.

It has been approved by the member bodies of the following countries:

|           |                |                       |
|-----------|----------------|-----------------------|
| Australia | Italy          | Romania               |
| Austria   | Korea, Rep. of | South Africa, Rep. of |
| Canada    | Netherlands    | Spain                 |
| France    | Philippines    | USSR                  |
| India     | Portugal       |                       |

No member body expressed disapproval of the document.

This International Standard cancels and replaces ISO Recommendation R 592-1967, of which it constitutes a technical revision.

# Essential oils — Determination of optical rotation

## 1 Scope and field of application

This International Standard specifies a method for determining the optical rotation of essential oils.

When dealing with solid oils, partially solid oils, oils that are highly viscous at room temperature or highly coloured oils, this determination is carried out on a solution of the oil.

## 2 References

ISO 212, *Essential oils — Sampling*.

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

## 3 Definitions

For the purposes of this International Standard, the following definitions apply :

**3.1 optical rotation of an essential oil,  $\alpha'_D$** : The angle expressed in milliradians and/or degrees of angle, described by the polarization plane of a luminous radiation whose wavelength is  $589,3 \pm 0,3$  nm, corresponding to the D lines of sodium, when such light travels through a thickness of 100 mm of essential oil under given conditions of temperature. When the determination is carried out on a different thickness, the value of  $\alpha'_D$  shall be computed by reference to a thickness of 100 mm.

**3.2 optical rotation of an essential oil in solution, called specific rotation,  $[\alpha]$** : The quotient of the optical rotation  $\alpha'_D$  of a solution of essential oil divided by the mass of essential oil in the unit of volume.

## 4 Reagents

Reagents shall be of analytical grade. Use distilled water or water of at least equivalent purity.

**4.1 Solvent** (only for essential oils that need to be tested in solution).

Use preferably 95 % (V/V) ethanol or carbon tetrachloride. It is advisable to check that the optical rotation of the solvent used is nil.

## 5 Apparatus

**5.1 Polarimeter**, having a precision of at least  $\pm 0,5$  mrad ( $\pm 0,03^\circ$ ) and adjusted to give  $0^\circ$  and  $180^\circ$  with water.

The polarimeter shall be checked with a quartz plate of known optical rotation or, if that is unavailable, with an aqueous solution containing 26,00 g of anhydrous pure saccharose per 100 ml of solution. The optical rotation of this solution shall be  $+ 604$  mrad ( $+ 34,62^\circ$ ) in a 200 mm layer, at a temperature of  $20^\circ\text{C}$ .

The instrument shall be in conditions of stability when in use, and non-electronic instruments shall be used in the dark.

### 5.2 Light source

Any device giving a light of wavelength  $589,3 \pm 0,3$  nm may be used, preferably a sodium vapour lamp.

**5.3 Polarimeter tubes**, usually  $100 \pm 0,5$  mm long.

When testing slightly coloured samples of low optical rotation, tubes of length  $200 \pm 0,5$  mm may be used. Tubes of length  $50 \pm 0,05$  mm or  $10 \pm 0,05$  mm or even less may be used, if necessary, for strongly coloured samples.

### 5.3.1 Determination at $20^\circ\text{C}$ or at another specified temperature

Use double-walled tubes to ensure water circulation at the required temperature, equipped with the thermometer (5.4).

### 5.3.2 Determination at ambient temperature

Any type of tube may be used, although it is advisable to use the type described in 5.3.1 in this case too.

**5.4 Standardized thermometer**, graduated in  $0,2$  or  $0,1^\circ\text{C}$  and allowing determining of temperatures between  $10$  and  $30^\circ\text{C}$ .

**5.5 Thermostatically controlled device**, for raising the temperature of the sample to  $20 \pm 0,2^\circ\text{C}$  or any other prescribed temperature.