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# International Standard



# 1271

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## Essential oils — Determination of carbonyl value — Free hydroxylamine method

*Huiles essentielles — Détermination de l'indice de carbonyle — Méthode à l'hydroxylamine libre*

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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.

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 1271 was prepared by Technical Committee ISO/TC 54. *Essential oils.*

International Standard ISO 1271 was first published in 1972. This second edition cancels and replaces the first edition, of which it constitutes a technical revision.

# Essential oils — Determination of carbonyl value — Free hydroxylamine method

## 1 Scope and field of application

This International Standard specifies a method for the determination of the carbonyl value of essential oils. It is applicable to essential oils which contain carbonyl compounds (especially ketones, excluding methylketones) which are difficult to convert to oximes by the method specified in ISO 1279.

The method is not applicable to essential oils which contain substantial amounts of esters or other alkali-sensitive constituents.

International Standards specifying requirements for individual essential oils will specify whether this method or the hydroxylammonium chloride method specified in ISO 1279<sup>1)</sup> is applicable.

## 2 References

ISO 212, *Essential oils — Sampling*.

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

## 3 Definition

For the purpose of this International Standard, the following definition applies.

**carbonyl value** (of an essential oil) : The number of milligrams of potassium hydroxide, per gram of essential oil, required to neutralize the hydrochloric acid liberated in the oximation reaction with hydroxylammonium chloride.

NOTE — Oximes are the result of the reaction of carbonyl compounds with hydroxylamine.

## 4 Principle

Conversion of the carbonyl compounds to oximes by reaction with free hydroxylamine liberated in a mixture of hydroxylammonium chloride and potassium hydroxide.

Titration of the excess alkali with hydrochloric acid solution, either colorimetrically or potentiometrically.

## 5 Reagents

All reagents shall be of recognized analytical grade and the water used shall be distilled water or water of at least equivalent purity.

**5.1 Hydrochloric acid**, standard volumetric solution,  $c(\text{HCl}) \approx 0,5 \text{ mol/l}$ .

**5.2 Potassium hydroxide solution**,  $c(\text{KOH}) \approx 0,5 \text{ mol/l}$ , in 95 % (V/V) ethanol.

**5.3 Bromophenol blue**, ethanolic solution.

Dissolve, by heating, 0,2 g of bromophenol blue in 3 ml of ethanolic potassium hydroxide solution,  $c(\text{KOH}) = 0,1 \text{ mol/l}$ , and 10 ml of 95 % (V/V) ethanol. After cooling, dilute to 100 ml with the same ethanol.

**5.4 Hydroxylammonium chloride**, ethanolic solution.

Dissolve 50 g of hydroxylammonium chloride in approximately 100 ml of water, add about 800 ml of 95 % (V/V) ethanol, then 10 ml of the ethanolic bromophenol blue solution (5.3) and dilute to 1 000 ml with 95 % (V/V) ethanol. Add the ethanolic potassium hydroxide solution (5.2) until the solution is green, if the liquid is observed in a thin layer, or until red, if the layer is thick.

A lemon-yellow colour shall be obtained when 0,05 ml of the hydrochloric acid solution (5.1) is added to 20 ml of the solution, and a red colour shall be obtained when 0,05 ml of the potassium hydroxide solution (5.2) is added to another 20 ml of the solution.

The solution is stable for one week.

1) ISO 1279, *Essential oils — Determination of carbonyl value — Hydroxylammonium chloride method*.