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Citrus fruits and derived products — Determination of essential oils content (Reference method)

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Foreword

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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.

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

Australia	India	Romania
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Canada	Kenya	Spain
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The member body of the following country expressed disapproval of the document on technical grounds :

USA

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Citrus fruits and derived products — Determination of essential oils content (Reference method)

1 Scope and field of application

This International Standard specifies the reference method for the determination of the total essential oils content of citrus fruits and their derived products (whole fruits, fruits cut into small pieces, skins, juices, concentrates, beverage bases, sweetened products etc.).

2 Principle

Boiling of a test portion, diluted or undiluted, and steam entrainment of the essential oils which are collected in a graduated tube; after cooling, direct reading from this tube of the volume of essential oils separated from the distillate.

3 Apparatus

3.1 Apparatus[1], for entrainment and recovery of essential oils, comprising a condenser and a trap terminating in a tube, of diameter 8 to 10 mm, graduated in 0,05 ml divisions, having a capacity of 4 ml.

3.2 Flask, of capacity 3 litres, suitable for connection to the apparatus (3.1).

3.3 Graduated measuring cylinders, of capacity 2 litres.

3.4 Boiling aid.

4 Procedure

4.1 Preparation of the test sample

NOTE — Sufficient test sample is required to provide test portions of 2 litres.

4.1.1 Products having low essential oils content (less than 0,1 ml per 100 ml or per 100 g of product)

Citrus fruit juices, for example, shall be used after simply stirring; thick, pulpy or syrupy products shall be thoroughly mixed with an equal mass of water.

4.1.2 Products rich in essential oils[2]

Suitably dilute the test sample to obtain an essential oils content of less than 0,1 ml per 100 ml or per 100 g of product.

4.1.3 Products very rich in essential oils (used as bases for carbonated drinks)[2]

Mix thoroughly by diluting with water in the proportion indicated in 4.1.2, operating in a high-speed mechanical mill in order to avoid separation.

4.1.4 Whole fruits, fruits cut into small pieces, and skins

Grind the sample finely and proceed as specified in 4.1.3.

4.2 Preparation of apparatus (3.1)

Start the circulation of water through the condenser and, if possible, moisten the inside of the condenser with a wetting agent, for example sodium secondary alkylsulphate.

Fill the trap with distilled water. If possible, immerse the trap itself in a large beaker of cold water during the test.

4.3 Test portion[2]

Transfer 2 litres of the test sample (4.1), measured by means of the graduated measuring cylinder (3.3) and corresponding to a volume V_0 or a mass m of the product before dilution, to the flask (3.2). If necessary, add the boiling aid (3.4).

4.4 Determination

Connect the flask to the apparatus (3.1) and start heating. When the liquid begins to boil, reduce the rate of heating so that only about one drop of distillate falls from the condenser per second.

1) An apparatus of the modified Clevenger type is illustrated, for information only, in the annex.

2) For products which are rich, or very rich, in essential oils (4.1.2 and 4.1.3), it is possible to reduce the volume of the test portion to 1 litre, modifying the capacity of the apparatus and the degree of dilution accordingly.