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Green coffee — Determination of loss in mass at 105 °C

Café vert — Détermination de la perte de masse à 105 °C

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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 6673 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 15, *Coffee*.

This second edition cancels and replaces the first edition (ISO 6673:1983), of which it constitutes a minor revision.

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Green coffee — Determination of loss in mass at 105 °C

1 Scope

This International Standard specifies a method for the determination of the loss in mass at 105 °C of green coffee.

It is applicable to decaffeinated and non-decaffeinated green coffee as defined in ISO 3509.

This method of determining the loss in mass can be considered, by convention, as a method for determining the water content and can be used as such by agreement between the interested parties, but it gives results which are lower, by about 1,0 %, than those obtained with the method described in ISO 1446 (this method serves only as a reference method for calibrating methods of determining the water content).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3509, *Coffee and its products — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3509 and the following apply.

3.1

loss in mass at 105 °C

principally water and small quantities of volatile matter which are vaporized under the conditions specified in this International Standard, and expressed as a percentage by mass

4 Principle

A test portion is heated at 105 °C for 16 h at atmospheric pressure.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

5.1 Oven, electrically heated, fitted with a system of forced ventilation and capable of being controlled at 105 °C ± 1 °C.

5.2 Dish, made of aluminium, glass or stainless steel, with a close-fitting lid. The diameter should be approximately 90 mm and the height 20 mm to 30 mm.

5.3 Analytical balance.

5.4 **Desiccator**, containing an efficient desiccant, for example anhydrous calcium sulfate or silica gel.

6 Sampling

It is important the laboratory receive a sample which is truly representative and has not been damaged or changed during transport or storage.

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 4072.

It is important to proceed as rapidly as possible when samples are exposed to the atmosphere, in order to prevent any pick up or loss of moisture.

7 Procedure

7.1 Preparation of the dish

Dry the dish (5.2) and its lid for 1 h in the oven (5.1) set at 105 °C.

Remove the dish and its lid from the oven and allow to cool to room temperature in the desiccator (5.4).

Weigh the dish and its lid to the nearest 0,1 mg.

7.2 Test portion

Place a test portion of approximately 10 g into the prepared dish (see 7.1) and spread the beans uniformly over the bottom of the dish.

Cover the dish with its lid and weigh to the nearest 0,1 mg.

If performing a series of tests, prepare dishes as described in 7.1 and place the covered and weighed dishes in the desiccator in order to avoid any pick up or loss of moisture.

7.3 Determination

Place the dish containing the test portion, with the lid removed but alongside or beneath the dish, in the oven (5.1), set at 105 °C, and dry for 16 h ± 0,5 h.

Fit the lid on the dish and place it in the desiccator (5.4). Allow to cool to room temperature and then weigh to the nearest 0,1 mg.

7.4 Number of determinations

Carry out two determinations on the same test sample.

8 Expression of results

The loss in mass at 105 °C, ω , expressed as a percentage by mass, is equal to

$$\omega = \frac{m_1 - m_2}{m_1 - m_0} \times 100 \%$$

where

m_0 is the mass, in grams, of the dish and lid (see 7.1);

m_1 is the mass, in grams, of the dish, test portion and lid before drying (see 7.2);

m_2 is the mass, in grams, of the dish, test portion and lid after drying (see 7.3).

Take as the result the arithmetic means of the two determinations (see 7.4).

9 Precision

An interlaboratory test, carried out at the international level, in which 14 laboratories participated, each performing two determinations, gave the statistical information (evaluated in accordance with ISO 5725:1986) summarized in Table 1.

10 Test report

The test report shall specify:

- all information necessary for the complete identification of the sample;
- the sampling method used, if known;
- the test method used, with reference to this International Standard;
- all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents which may have influenced the test result(s);
- the test result(s) obtained, or, if the repeatability has been checked, the final quoted result obtained.

Table 1 — Statistical results

Results expressed as percentages by mass

| Sample | A | B | C | D | E |
|--|-------|-------|-------|-------|-------|
| Number of laboratories retained after eliminating outliers | 13 | 13 | 13 | 13 | 13 |
| Mean | 8,50 | 9,11 | 9,14 | 11,10 | 11,40 |
| Standard deviation of repeatability (s_r) | 0,09 | 0,04 | 0,06 | 0,09 | 0,12 |
| Coefficient of variation of repeatability | 1,1 % | 0,4 % | 0,7 % | 0,8 % | 1,1 % |
| Repeatability limit, r ($=2,83 \times s_r$) | 0,25 | 0,11 | 0,17 | 0,25 | 0,34 |
| Standard deviation of reproducibility (s_R) | 0,21 | 0,42 | 0,33 | 0,19 | 0,22 |
| Coefficient of variation of reproducibility | 2,5 % | 4,6 % | 3,6 % | 1,7 % | 1,9 % |
| Reproducibility limit, R ($=2,83 \times s_R$) | 0,59 | 1,19 | 0,93 | 0,54 | 0,62 |

Bibliography

- [1] ISO 1446, *Green coffee — Determination of water content — Basic reference method*
- [2] ISO 4072, *Green coffee in bags — Sampling*
- [3] ISO 5725:1986, *Precision of test methods — Determination of repeatability and reproducibility by inter-laboratory tests* (now withdrawn)
- [4] ISO 5725-1:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*
- [5] ISO 5725-2:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

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