INTERNATIONAL STANDARD

ISO 9768

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Tea — Determination of water extract

Thé — Détermination de l'extrait à l'eau

Reference number
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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.

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.

International Standard ISO 9768 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 8, *Tea*.

This second edition cancels and replaces the first edition (ISO 9768:1990), which has been technically revised.

Annex A of this International Standard is for information only.

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Tea — Determination of water extract

1 Scope

This International Standard specifies a method for the determination of the water extract from tea.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1573:1980, *Tea — Determination of loss in mass at 103 °C.*

3 Definition

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

3.1 water extract: The soluble matter extracted from a test portion by boiling water, under the conditions specified in this International Standard, expressed as a percentage by mass on a dry basis.

4 Principle

Extraction of soluble matter from a test portion of the product by means of water boiling under reflux. Filtration, washing, drying and weighing of the hot-water-insoluble residue. Calculation of the water extract.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

5.1 Oven, constant-temperature and fan-assisted, capable of being operated at 103 °C ± 2 °C.

5.2 Crucible, made of sintered borosilicate glass, of porosity grade P160 (pore size index > 160 µm, ⩽ 250 µm), 40 mm in diameter and of 70 ml capacity.

5.3 Desiccator, containing an efficient desiccant.

5.4 Flask, of 500 ml capacity, fitted with a reflux condenser.

5.5 Filter flask, of 1 litre capacity, for vacuum filtration.

5.6 Test sieves, of nominal aperture size 1,4 mm and 3 mm.

5.7 Analytical balance, capable of weighing to an accuracy of 0,001 g.

6 Sampling

It is important that 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 1839.[1)]

7 Preparation of test sample

Use a test sample of known dry matter content, determined using the method specified in ISO 1573.

1) ISO 1839:1980, *Tea — Sampling.*

Teas of which 60 % or more is retained on a 1,4 mm sieve shall be ground to pass a 3 mm sieve prior to analysis.

8 Procedure

NOTE 1 If it is required to check whether the repeatability requirement is met, carry out two determinations on the same test sample.

8.1 Preparation of the crucible

Heat the clean crucible (5.2) for 1 h in the oven (5.1) set at 103 °C. Cool in the desiccator (5.3) and weigh to the nearest 0,001 g.

8.2 Test portion

Weigh, to the nearest 0,001 g, 2 g of the test sample (clause 7) into the flask (5.4).

8.3 Determination

Add to the test portion (8.2) 200 ml of hot distilled water, or water of at least equivalent purity, and reflux over low heat for 1 h, rotating the flask occasionally. Filter hot under vacuum through the prepared crucible (8.1) using the filter flask (5.5). Repeatedly wash out the flask with hot distilled water, transferring all the insoluble residue into the crucible. Finally, wash the residue with 200 ml of hot distilled water. Dry the residue by suction. Heat the crucible and its contents in the oven (5.1) set at 103 °C for 16 h (i.e. overnight). Cool in the desiccator (5.3) and weigh to the nearest 0,001 g.

9 Calculation

The water extract yielded by the test sample, expressed as a percentage by mass on a dry basis, is given by the formula

$$\frac{(m_0 \times w) - (m_1 \times 100)}{m_0 \times w} \times 100$$

where

m_0 is the mass, in grams, of the test portion;

m_1 is the mass, in grams, of the dried insoluble residue;

w is the dry matter content, expressed as a percentage by mass, of the test sample. It is equal to 100 minus the loss in mass at 103 °C determined using the method specified in ISO 1573.

10 Precision

See annex A for statistical results of interlaboratory tests.

10.1 Repeatability

The absolute difference between two independent test results, obtained using the same method on identical test material in the same laboratory by the same operator using the same equipment within a short interval of time, should not be greater than 1,0 % (*m/m*).

10.2 Reproducibility

The absolute difference between two single test results, obtained using the same method on identical test material in different laboratories with different operators using different equipment, should not be greater than 2,5 % (*m/m*).

11 Test report

The test report shall specify

— the method in accordance with which sampling was carried out, if known,

— the method used,

— the test result obtained, and

— if the repeatability has been checked, the final quoted result obtained.

It shall also mention all operating details not specified in this International Standard, or regarded as optional, together with details of any incidents which may have influenced the result.

The test report shall include all information necessary for the complete identification of the sample.

Annex A
(informative)

Statistical results of interlaboratory tests on tea

Four interlaboratory tests, carried out between 1984 and 1989 under the auspices of the International Organization for Standardization, gave the following statistical results (evaluated in accordance with ISO 5725[2]).

Year	1984	1986	1988	1989
Number of laboratories	7	21	16	10
Number of samples	3	6	6	3
Repeatability, r	0,877 to 1,259	0,677 to 1,114	1,37 to 1,60	0,50 to 0,63
Reproducibility, R	1,252 to 1,422	1,871 to 2,934	4,69 to 6,19	1,02 to 1,45

2) ISO 5725:1986, *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests.*