International Standard 5566

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Turmeric — Determination of colouring power — Spectrophotometric method

Curcuma — Détermination du pouvoir colorant — Méthode spectrophotométrique

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Foreword

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

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No member body expressed disapproval of the document.

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Turmeric — Determination of colouring power — Spectrophotometric method

1 Scope and field of application

This International Standard specifies a spectrophotometric method for the determination of the colouring power of turmeric.

2 References

ISO 948, *Spices and condiments — Sampling.*

ISO 2825, *Spices and condiments — Preparation of a ground sample for analysis.*

3 Definition

colouring power of turmeric : The curcuminoids content of turmeric, expressed as curcumin as a percentage by mass.

4 Principle

Extraction of the pigments of turmeric with hot ethanol, dilution of the extract and spectrophotometric measurement at the wavelength of maximum absorption (i.e. 425 nm).

5 Reagent

5.1 Ethanol, 96 % (*V*/*V*).

6 Apparatus

Usual laboratory apparatus, and in particular

6.1 Round-bottomed extraction flask, of capacity 100 ml, fitted with a **reflux condenser.**

6.2 Pipette, of capacity 5 ml.

6.3 One-mark volumetric flasks, of capacities 100 and 250 ml.

6.4 Spectrophotometer, suitable for making measurements of absorbance at 425 nm.

6.5 Matched spectrophotometric cells (of silica), of optical path length 1 cm.

6.6 Analytical balance.

7 Sampling

Sample the product by the method specified in ISO 948.

8 Procedure

8.1 Preparation of the test sample

Prepare the sample by the method specified in ISO 2825. The degree of fineness of grinding used shall be about 500 µm.

Ground (powdered) turmeric is analysed as received, without preparation, the degree of fineness usually being appropriate.

8.2 Test portion

Weigh, to the nearest 0,001 g, about 0,5 g of the ground sample.

8.3 Determination

Place the test portion in the extraction flask (6.1), add 30 ml of the ethanol (5.1) and boil under reflux for 2,5 h. Allow the extract to cool and filter quantitatively into the 100 ml volumetric flask (6.3). Wash the residue on the filter thoroughly, collecting the washings in the volumetric flask. Dilute the contents of the flask to the mark with the ethanol (5.1).

Transfer, by means of the pipette (6.2), 5 ml of the filtered extract to the 250 ml volumetric flask (6.3). Dilute to the mark with the ethanol. Fill one of the spectrophotometric cells (6.5) with this solution and fill the other with the ethanol.

Measure the absorbance (A) at 425 nm using the ethanol as the reference liquid.

9 Expression of results

The colouring power of turmeric, expressed as curcumin as a percentage by mass, is equal to

$$\frac{A \times D \times 100}{E^{1\,\%}_{1\,cm} \times m}$$

$$= \frac{A \times 50 \times 100}{1\,607 \times m}$$

where

A is the measured absorbance;

D is the dilution of the extract, i.e.

$$\frac{100}{5} \times \frac{250}{100} = 50$$

$E^{1\,\%}_{1\,cm}$ is the specific absorbance of a 1 % solution of curcumin measured at 425 nm in cells of optical path length 1 cm, i.e. 1 607;

m is the mass, in grams, of the test portion.

NOTE — The result may also be expressed on the dry basis by means of the formula

$$\frac{A \times 50 \times 100 \times 100}{1\,607 \times m \times (100 - H)}$$

where H is the moisture content of the sample, expressed as a percentage by mass.

10 Test report

The test report shall show the method used and the results obtained. It shall also mention all operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances likely to have influenced the results.

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