SLOVENSKI STANDARD
SIST EN 1133:1996

01-avgust-1996

Sadni in zelenjavni sokovi - Ugotavljanje formolnega števila

Fruit and vegetable juices - Determination of the formol number

Frucht- und Gemüsesäfte - Bestimmung der Formolzahl

Jus de fruits et de légumes - Détermination de l'indice de formol

Ta slovenski standard je istoveten z: **EN 1133:1994**

ICS:

67.160.20 Brezalkoholne pijače Non-alcoholic beverages

SIST EN 1133:1996 **en**

EUROPEAN STANDARD **EN 1133**

NORME EUROPÉENNE

EUROPÄISCHE NORM October 1994

UDC 663.81/.82:620.1:543.8

Descriptors: food products, beverages, fruit and vegetable juices, chemical analysis, determination of content, formol, potentiometric methods

English version

Fruit and vegetable juices - Determination of the formol number

Jus de fruits et de légumes - Détermination de l'indice de formol

Frucht- und Gemüsesäfte - Bestimmung der Formolzahl

This European Standard was approved by CEN on 1994-09-29. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 174 "Fruit and vegetable juices - Methods of analysis", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a National Standard, either by publication of an identical text or by endorsement, at the latest by April 1995, and conflicting national standards shall be withdrawn at the latest by April 1995.

Annexes designated "informative" are given only for information. In this standard annexes A and B are informative.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope

This european standard specifies a method for the determination of the Formol Number of fruit and vegetable juices and related products.

2 Normative references

This european standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this european standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 5725:1986	Precision of test methods - Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests
ISO 3696:1987	Water for analytical laboratory use - Specification and test methods

3 Definitions and symbols

For the purposes of this standard, the following definition applies :

Formol Number

The number of millimoles of sodium hydroxide consumed per litre of test sample according to the method described below. For conformity with existing methods (see Annex A), the formol Number is reported as the number of millilitres of sodium hydroxide solution, c (NaOH) = 0,1 mol/l required per 100 ml of test sample.

For the purposes of this standard, the following symbols apply:

c Substance concentration ;
r Mass concentration.

4 Principle

Upon addition of formaldehyde solution to the test sample, one H^+ -ion is liberated per molecule of amino acid present. This ion is then titrated potentiometrically with sodium hydroxide solution. The Formol Number is thus a measure of the amino acid content of the test sample, with the following provisions: The secondary amino group of histidine does not react; those of proline and hydroxyproline react to about 75 %. Tertiary nitrogen and guanidine groups undergo no reaction.

5 Reagents

5.1 General

Use only reagents of recognized analytical grade and only water in accordance with at least grade 3 of ISO 3696:1987.

5.2 **Sodium hydroxide solution,** c (NaOH) = 0,25 mol/l.

5.3 **Formaldehyde solution,** pH 8,1.

Formaldehyde solution, ω (CH_2O) = at least 350 g/l, adjusted precisely to pH 8,1 on the pH meter with 0,25 mol/l sodium hydroxide (5.2). This solution shall be prepared freshly on the day of use.

5.4 **Hydrogen peroxide,** ω (H_2O_2) = 300 g/l.

6 Apparatus

Usual laboratory equipment and, in particular, the following :

6.1 **pH meter,** accurate to at least 0,05 pH units.

6.2 **pH glass electrode**

6.3 **Reference electrode,** for example calomel electrode.

6.4 **Combination pH glass electrode** (alternative to 6.2 and 6.3).

The pH meter and electrode(s) shall be calibrated and serviced according to the manufacturer's instructions.

7 Procedure

7.1 Preparation of the test sample

Normally products shall not be pretreated and their analysis by this method shall be on a volumetric basis, results being expressed per 100 millilitres of sample. The analysis of concentrated products may also be carried out on a volumetric basis, after dilution to a known relative density. In this case, the relative density shall be indicated. Based on a weighed sample and taking the dilution facto for analysis into account, the results may also be expressed per 100 grams of product. In products with high viscosity and/or very high content of cells (for example pulp), determination on the basis of weighed test sample is the usual procedure.

In the case of lemon juice or other high acidic juices, take 5 ml of juice and 20 ml water and continue as below. If the sample contains sulfur dioxyde, it shall be treated with a few drops of hydrogen peroxide solution (5.4) before titration.

7.2 Determination

While stirring, adjust 25 ml of test sample in a beaker to pH = 8,1 using solution (5.2) and the pH meter. Add 10 ml solution (5.3) and continue stirring. Leave to stand for 1 minute, then titrate the solution to pH = 8,1 using solution (5.2), while continuing stirring. Note the number of ml (n) of solution (5.2) required for the titration. If the number of ml required exceeds 20 ml, repeat the titration using 15 ml solution (5.3) in place of 10 ml.

Use only sodium hydroxide solution c (NaOH) = 0,25 mol/l (5.2) for the determination, irrespective of the Formol number of the test sample.

8 Calculation

Calculate the Formol Number as follows :

Formol Number = 10 x n

Any additional dilution and the relation of the value to mass or volume (see 7.1) shall be taken into account if applicable. If a concentrated product has been diluted to single strength, report the relative density of the single strength sample. The Formol Number can be calculated per 100 g of test sample, taking into account the relative density.

Report the Formol Number in millilitres of sodium hydroxide solution c (NaOH) = 0,1 mol/l per 100 ml of test sample, to one decimal place.

9 Precision

Details of the interlaboratory test on the precision of the method are summarized in annex B. The values derived from the interlaboratory test may not be applicable to analyte concentration ranges and matrices other than given in annex B.

9.1 Repeatability

The absolute difference between two single test results found on identical test material by one operator using the same apparatus within the shortest feasible time interval will exceed the repeatability value r in not more than 5 % of the cases.

The value is : r = 0,4 mmol NaOH/100 ml.

9.2 Reproducibility

The absolute difference between two single test results on identical test material reported by two laboratories will exceed the reproducibility value R in not more than 5 % of the cases.

The value is : R = 1,1 mmol NaOH/100 ml.

10 Test report

The test report shall contain the following data :

- all information necessary for the identification of the sample (kind of sample, origin of sample, designation) ;

- a reference to this european standard ;

- the date and type of sampling procedure (if possible) ;

- the date of receipt ;

- the date of test ;

- the test results and units in which they have been expressed ;

- whether the repeatability of the method has been verified ;

- any particular points observed in the course of the test ;

- any operations not specified in the method or regarded as optional, which might have affected the results

Annex A (informative)

Bibliography

[1] Determination of the Formol Number: No 30, 1984. - In: Analyses [Collection] / InternationalFederation of Fruit Juice Producers. - Loose-leaf edition, as of 1989. - Zug : Swiss Fruit Union.

[2] Untersuchung von Lebensmitteln: Bestimmung des Formolwertes von Fruchtsäften:L31.00-8, 1983-11 [Food Analysis: Determination of the formol number of fruit juices: L31.00-8, 1983-11] - In : Amtliche Sammlung von Untersuchungsverfahren nach § 35 LMBG: Verfahren zur Probenahme und Untersuchung von Lebensmitteln, Tabakerzeugnissen, kosmetischen Mitteln und Bedarfsgegenständen / Bundesgesundheitsamt [In : Collection of official methods under article 35 of the German Federal Foods Act : Methods of sampling and analysis of foods, tobacco products, cosmetics and commodity goods / Federal Health Office] - Loseblattausgabe, Stand 31.12.1991, Bd. I. [Loose-leaf edition, as of 1991-12-31, Vol. I.] - Berlin, Köln: Beuth Verlag GmbH.