

Food analysis - Determination of furan in coffee and coffee products by headspace gas chromatography and mass spectrometry (HS GC-MS)

EESTI STANDARDI EESSÕNA

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English Version

Food analysis - Determination of furan in coffee and coffee products by headspace gas chromatography and mass spectrometry (HS GC-MS)

Analyse des produits alimentaires - Dosage du furane dans le café et les produits à base de café par chromatographie en phase gazeuse avec espace de tête couplée à la spectrométrie de masse (ET-CPG-SM)

Lebensmittelanalytik - Bestimmung von Furan in Kaffee und Kaffee-Erzeugnissen mit Headspace-Gaschromatographie und Massenspektrometrie (HS GC-MS)

This European Standard was approved by CEN on 7 February 2015.

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Contents		Page
Foreword		3
1	Scope	4
2	Normative references	4
3	Principle	4
4	Reagents	4
5	Apparatus	5
6	Procedure	6
7	Calculation	9
8	Precision	10
9	Test report	11
Annex A (informative) Typical chromatograms		12
Annex B (informative) Precision data		14
Bibliography		15

Foreword

This document (EN 16620:2015) has been prepared by Technical Committee CEN/TC 275 "Food analysis - Horizontal methods", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.

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1 Scope

This European Standard specifies a method for the determination of furan in coffee and coffee products with headspace-gas chromatography-mass spectrometry (HS-GC-MS), see [1] and [2]. Coffee products in the scope of this method are extracts which have been spray-dried, agglomerated or freeze-dried. The method has been validated in an interlaboratory study via the analysis of naturally contaminated samples of spray-dried coffee, freeze-dried coffee and ground roasted coffee ranging from 264 µg/kg to 2 840 µg/kg.

2 Normative references

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

EN ISO 3696:1995, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987)*

3 Principle

Coffee and coffee products are weighed into headspace vials, diluted with water and incubated at 50 °C for 30 min. The furan content in the headspace is measured with HS-GC-MS. Quantification is done by using a standard addition curve, taking into account deuterated furan (*d4*-furan) as internal standard.

4 Reagents

Use only reagents of recognized analytical grade and water complying with grade 1 of EN ISO 3696:1995, unless otherwise specified. Solvents shall be of quality for HPLC analysis.

4.1 Furan, (CAS 110-00-9), mass concentration $\rho = 0,936$ g/ml.

4.2 *d4*-Furan, (CAS 6142-90-1), $\rho = 0,991$ g/ml.

4.3 Methanol.

4.4 Potassium hydroxide, aqueous solution, $\rho = 250$ g/l.

4.5 Stock solutions

4.5.1 Furan stock solution, ρ approximately 2,50 mg/ml.

Place 20 ml of methanol in a headspace vial and seal the vial. Weigh the sealed vial. Using a chilled syringe, transfer 50 µl of furan through the septum of the vial into the methanol. Reweigh the sealed vial. Mix the contents well. The solution is stable for 2 weeks at 4 °C. Pierced headspace vials shall be re-capped.

4.5.2 *d4*-Furan stock solution, ρ approximately 2,50 mg/ml.

Place 20 ml of methanol in a headspace vial and seal the vial. Weigh the sealed vial. Using a chilled syringe, transfer 50 µl of *d4*-furan through the septum of the vial into the methanol. Reweigh the sealed vial. Mix the contents well. The solution is stable for 2 weeks at 4 °C. Pierced headspace vials shall be re-capped.