

Foodstuffs - Determination of trace elements - Pressure digestion

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NATIONAL FOREWORD

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English Version

Foodstuffs - Determination of trace elements - Pressure digestion

Produits alimentaires - Dosage des éléments traces -
Digestion sous pression

Lebensmittel - Bestimmung von Elementspuren -
Druckaufschluss

This European Standard was approved by CEN on 9 August 2014.

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Contents	Page
Foreword.....	3
1 Scope	4
2 Normative references	4
3 Principle	4
4 Reagents	4
5 Apparatus and equipment	5
5.1 General	5
5.2 Pressure digestion apparatus	5
5.2.1 General	5
5.2.2 Pressure digestion apparatus with conventional heating	5
5.2.3 Pressure digestion apparatus with microwave-assisted heating	5
5.2.4 Pressure digestion autoclave with microwave-assisted heating	5
5.3 Ultrasonic bath with heating device	6
5.4 Subboiling distillation apparatus,	6
5.5 Stripping apparatus,	6
6 Procedure	6
6.1 General	6
6.2 Sample preparation	6
6.3 Pressure digestion conditions	6
6.3.1 Sample	6
6.3.2 Acid addition	7
6.3.3 Digestion temperature	7
6.3.4 Digestion time	8
6.3.5 Cooling	8
6.3.6 Treatment of the digestion	8
6.3.7 Quality control of the analysis	8
6.4 Example of pressure digestions	8
6.4.1 Example of a high-pressure ashing digestion with conventional heating	8
6.4.2 Example of a microwave digestion	9
6.4.3 Example of a digestion in a microwave-heated autoclave	9
Annex A (normative) Figures of apparatus	10
Bibliography	12

Foreword

This document (EN 13805:2014) 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of an identical text or by endorsement, at the latest by April 2015 and conflicting national standards shall be withdrawn at the latest by April 2015.

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

This document supersedes EN 13805:2002.

The changes between this edition and the previous one are as follows:

- a) restructuring of some clauses;
- b) 5.2.2, "Pressure digestion apparatus with conventional heating" was added;
- c) 5.2.3, "Pressure digestion apparatus with microwave-assisted heating" was added;
- d) 5.2.4, "Pressure digestion autoclave with microwave-assisted heating" was added;
- e) 6.3.2, "Acid addition" was revised"
- f) 6.4, "Example of pressure digestions" was completely revised and completed;
- g) bibliographic referenced were added;
- h) the whole document was editorially revised.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a method for the pressure digestion of foodstuffs intended for the determination of elements. This method has been collaboratively tested in combination with atomic absorption (flame, electrothermal (ET), hydride, cold-vapour) techniques and ICP-MS. Other techniques such as e.g. ICP-OES, voltammetry or atomic fluorescence can be used in combination with this European Standard.

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 13804, *Foodstuffs - Determination of elements and their chemical species - General considerations and specific requirements*

3 Principle

The method is a physicochemical pressure digestion method used to mineralize the sample material and to prepare a measurement solution containing elements to be determined. The method described here is applied when the measurement has been validated in combination with this digestion method and reference is made to this European Standard. This procedure will relate to the total element content depending on reagents and determination procedures used.

The sample is homogenized avoiding contamination. Afterwards it is digested with nitric acid (sometimes with addition of other acids), at high temperatures and pressure in a closed vessel, applying conventional or microwave-assisted heating [1], [2], [3].

4 Reagents

The concentration of the trace elements in reagents and water used shall be low enough to not affect the results of the determination.

In the case of insufficient purity, it is necessary to purify nitric acid and hydrochloric acid in a distillation apparatus (see 5.4 and Figure A.1).

4.1 Nitric acid,

mass fraction w of not less than 65 % and density of approximately $\rho(\text{HNO}_3) = 1,4 \text{ g/ml}$.

4.2 Diluted nitric acid,

mix nitric acid (4.1) and water in a proportion of at least (1 + 9) parts by volume.

4.3 Hydrochloric acid,

w not less than 30 % and approximately $\rho(\text{HCl}) = 1,15 \text{ g/ml}$.

4.4 Hydrofluoric acid, w

not less than 40 % and approximately $\rho(\text{HF}) = 1,14 \text{ g/ml}$.

4.5 Hydrogen peroxide, w

not less than 30 % and approximately $\rho(\text{H}_2\text{O}_2) = 1,11 \text{ g/ml}$.