

Foodstuffs — Determination of trace elements — Determination of total arsenic and selenium by hydride generation atomic absorption spectrometry (HGAAS) after pressure digestion

The European Standard EN 14627:2005 has the status of a
British Standard

ICS 67.050

National foreword

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English version

**Foodstuffs - Determination of trace elements - Determination of
total arsenic and selenium by hydride generation atomic
absorption spectrometry (HGAAS) after pressure digestion**

Produits alimentaires - Dosage des éléments traces -
Dosage de l'arsenic total et du sélénium par spectrométrie
par absorption atomique par génération d'hydrures
(SAAGH) après digestion sous pression

Lebensmittel - Bestimmung von Elementspuren -
Bestimmung von Gesamtarsen und Selen mit
Atomabsorptionsspektrometrie-Hydridtechnik (HGAAS)
nach Druckaufschluss

This European Standard was approved by CEN on 15 March 2005.

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Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Principle.....	4
4 Reagents.....	5
5 Apparatus and equipment	8
6 Procedure	8
7 Calculation.....	10
8 Limit of quantification.....	10
9 Precision.....	11
10 Test report	12
Annex A (informative) Results of the inter-laboratory tests.....	13
Bibliography.....	15

Foreword

This document (EN 14627:2005) 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of an identical text or by endorsement, at the latest by October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

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

1 Scope

This European Standard specifies two methods: one method for the determination of total arsenic and another method for the determination of selenium in foodstuffs by hydride generation atomic absorption spectrometry (HGAAS) after pressure digestion.

Specific foodstuffs for which European Standards exist are excluded from the scope of this horizontal European Standard. It is the task of the analyst to review if vertical standards exist.

For the determination of total arsenic in high concentration in e.g. seafood, the method specified in EN 14332 can be used.

2 Normative references

The following referenced documents are indispensable for the application of this document. 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 trace elements — Performance criteria, general considerations and sample preparation.*

EN 13805 *Foodstuffs — Determination of trace elements — Pressure digestion.*

3 Principle

3.1 General

Determination of the element to be determined in the test solution by HGAAS after pressure digestion according to EN 13805.

WARNING — The use of this standard may involve hazardous materials, operations and equipment. This standard does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate health and safety practices and determine the applicability or regulatory limitations prior to use.

3.2 Determination of total arsenic

Arsenic ions are converted to arsenic hydride by sodium borohydride in an acid solution. Arsenic hydride is transferred by a gas stream into a heated measurement cell and decomposed. Arsenic is determined at 193,7 nm.

Since arsenic (III) and arsenic (V) show a different sensitivity with the hydride technique, it is necessary to reduce arsenic (V) to arsenic (III) in order to avoid incorrect measurements.

A digestion temperature up to 320 °C may be necessary in order to enable the hydridisation of the arsenic compounds and in order to determine all different arsenic species in the foodstuff.

NOTE This known fact in the case of materials of marine origin was additionally observed for Rice powder and Kidney powder during the inter-laboratory tests for this procedure.

3.3 Determination of selenium

Selenium ions are converted to selenium hydride by sodium borohydride in an acid solution. This selenium hydride is transferred by a gas stream into a heated measurement cell and decomposed. Selenium is determined at 196,0 nm.