

**Foodstuffs —
Determination of trace
elements —
Determination of
inorganic arsenic in
seaweed by hydride
generation atomic
absorption
spectrometry (HGAAS)
after acid extraction**

ICS 67.050

National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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par spectrométrie d'absorption atomique par génération
d'hydrures (SAAGH) après extraction acide

Lebensmittel - Bestimmung von Elementspuren -
Bestimmung von anorganischem Arsen in Meeresalgen mit
Atomabsorptionsspektrometrie-Hydridtechnik (HGAAS)
nach Säureextraktion

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Foreword

This document (EN 15517:2008) 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of an identical text or by endorsement, at the latest by September 2008, and conflicting national standards shall be withdrawn at the latest by September 2008.

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1 Scope

This document specifies a procedure for the determination of hydrochloric acid (gastric acid concentration) extractable inorganic arsenic in seaweed. Collaborative studies have been carried out (Annex A). The method is suitable for the determination of inorganic arsenic not less than 1 mg/kg and below 100 mg/kg on a dry weight basis. The amount of inorganic arsenic is considered to be that part determined by the procedure described in this document.

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*

3 Principle

Arsenic compounds are extracted from the sample by diluted hydrochloric acid (in accordance with EN 71-3 [5]) and the arsenic in the extract is determined by hydride generation AAS. In acidic media inorganic compounds of arsenic(III) and arsenic(V) as well as the monomethylarsonic acid (MMA) and dimethylarsinic (cacodylic) acid (DMA) form a volatile hydride with sodium borohydride. There is no reaction of the stable organic arsenic compounds like arsenosugar, arseno-betaine and arseno-choline under these conditions. The gaseous hydride is transferred into a heated measuring cell (cuvette) by means of a carrier gas stream and decomposed. The absorption at 193,7 nm (arsenic line) serves as a measure of arsenic concentration. The hydride signal sensitivity of DMA reaches generally low rates as compared to As(III). The contribution of MMA in the hydride signal can be neglected, since MMA occurs in seaweed only in small amounts. The hydride generation AAS in combination with this hydrochloric acid extraction may be used as nearly selective method of determination for inorganic arsenic.

Generation of arsine from As(III) is much faster and gives greater sensitivity than generation from As(V) and is also less subject to interference. Arsenic(V) shall be reduced to arsenic(III) (pre-reduction) in order to avoid incorrect measurements.