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Fertilizers - Extraction of water soluble micro-nutrients
in fertilizers and removal of organic compounds from
fertilizer extracts

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**Fertilizers - Extraction of water soluble micro-nutrients in
fertilizers and removal of organic compounds from
fertilizer extracts**

Engrais - Extraction des oligo-éléments soluble dans
l'eau des engrais et élimination des composés
organiques dans les extraits d'engrais

Düngemittel - Extraktion wasserlöslicher
Spurennährstoffe aus Düngemitteln und Beseitigung
organischer Verbindungen aus Düngemittelextrakten

This European Standard was approved by CEN on 15 October 2017.

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European foreword

This document (EN 16962:2018) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, 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of an identical text or by endorsement, at the latest by July 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

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

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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Introduction

The preparation of this document is based on a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/335) concerning the modernization of methods of analysis of fertilizers in the framework of Regulation (EC) No 2003/2003 [1].

Water extraction is empirical and in many cases cannot be quantitative. The extraction is dependent on temperature and extraction time, on the ratio of water/sample and intensity of the extraction. To reduce the level of uncertainty of the extraction step to a reasonable level it is necessary to strictly follow the given procedure. The method can be applied to mineral fertilizers with micro-nutrient content of $\leq 10\%$ as well as of $> 10\%$. Removal of organic compounds is not usually necessary if FAAS or ICP-AES method of determination is used. It is applied only in some cases for determination of boron and molybdenum by spectrophotometric methods, determination of boron by acidimetric titration and gravimetric determination of molybdenum. The method for removal of organic compounds is a part of this standard.

WARNING — Persons using this European Standard should be familiar with normal laboratory practice. This European Standard does not purport to address all of the safety issues, if any, associated with its use. It is the responsibility of the user to establish appropriate health and safety practices and to ensure compliance with any national regulatory conditions.

IMPORTANT — It is absolutely essential that tests conducted according to this European Standard are carried out by suitably trained staff.

1 Scope

This European Standard specifies a method for the extraction of water soluble forms of boron, cobalt, copper, iron, manganese, molybdenum and zinc from mineral fertilizers containing one or more micro-nutrients and the procedure for removal of organic compounds from the water extracts.

The extracts can be analysed according to EN 16963, EN 16965, prEN 17041, prEN 17042, prEN 17043 and CEN/TS 17060.

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 12944-1, *Fertilizers and liming materials and soil improvers — Vocabulary — Part 1: General terms*

EN 12944-2, *Fertilizers and liming materials and soil improvers — Vocabulary — Part 2: Terms relating to fertilizers*

EN 16963, *Fertilizers — Determination of boron, cobalt, copper, iron, manganese, molybdenum and zinc using ICP-AES*

EN 16965, *Fertilizers — Determination of cobalt, copper, iron, manganese and zinc using flame atomic absorption spectrometry (FAAS)*

prEN 17043, *Fertilizers — Determination of molybdenum in concentrations ≤ 10 % using spectrometry of a complex with ammonium thiocyanate*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12944-1 and EN 12944-2 apply.

4 Principle

The micro-nutrients are extracted by shaking the fertilizer sample in water at (20 ± 2) °C. Extracts are acidified after the extraction to avoid hydrolysis. Organic matter is removed if necessary by boiling after addition of hydrogen peroxide.

5 Sampling and sample preparation

Sampling and sample preparation are not part of this Standard. A recommended sampling method is given in EN 1482-1 [2] and a recommended sample preparation method in EN 1482-2 [3].

6 Reagents

All reagents shall be of recognized analytical grade and they shall have negligible concentration of the element to be determined if compared to the lowest concentration of that element in the sample solution.