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# Väetised. Komplekseerunud mikroelementide sisalduse ja komplekseerunud mikroelementide fraktsiooni määramine

Fertilizers - Determination of the complexed micro-nutrient content and of the complexed fraction of micro-nutrients

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

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**ICS** 65.080

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 15962

January 2011

ICS 65.080

English Version

# Fertilizers - Determination of the complexed micro-nutrient content and of the complexed fraction of micro-nutrients

Engrais - Dosage de la teneur en oligo-élément complexé et de la fraction complexée des oligo-éléments

Düngemittel - Bestimmung des Gehalts an komplexgebundenen Spurennährstoffionen und der komplexgebundenen Fraktion von Spurennährstoffen

This European Standard was approved by CEN on 3 December 2010.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 15962:2011) 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of an identical text or by endorsement, at the latest by July 2011, and conflicting national standards shall be withdrawn at the latest by July 2011.

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# 1 Scope

This European Standard specifies a general method for the determination of the micronutrients complexed by complexing agents in fertilizers. The method allows the determination of the total concentration of each complexed micronutrient in complexes after subtraction of the chelated micro-nutrients content, but it does not identify the individual complexing agents.

This procedure concerns EC-fertilizers which contain complexed micro-nutrients covered by Regulation (EC) No 2003/2003. The method is applicable to a mass fraction of the metal complexed of at least 0,07 %, 0,006 % and 0,035 % of Fe, Mn and Zn respectively (see [2]). A lower limit of quantification has not been established for Cu and Co.

# 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 1482-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

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

# 3 Principle

The method is based on the precipitation of the inorganic forms at pH 9. Then the complexed forms of an element remain in solution and are separated from the non complexed forms. The complexed forms are collected and their content determined by spectrometry, as well as the soluble element content.

NOTE For additional information see [2] and [3].

# 4 Interferences

Any substance combining with a micro-nutrient to form a stable soluble compound (chelate or complex) at pH 9, will prevent the precipitation of the metal, and account for a certain degree of complexation. This is the case for chelating agents. If the presence of chelates is suspected the appropriate analytical method should be used (see Bibliography) to identify and quantify the amount of element chelated, that should be subtracted from the amount of the element given by this method in order to obtain the actual amount of element complexed.

# 5 Apparatus

All glassware, filters, and equipment parts coming in contact with samples and solutions, should be appropriate for micro-nutrient analysis, be very clean and free from contamination, especially by the elements Co, Cu, Fe, Mn, and Zn.

Usual laboratory equipment, glassware and in particular the following:

**5.1 Magnetic stirrer.**

**5.2 Balance,** capable for weighing to an accuracy of 1 mg.

**5.3 pH-meter,** equipped with a glass electrode; the system shall be calibrated with pH 7 and pH 10 calibration buffers.

**5.4 Membrane filters,** micro-membrane filters resistant to aqueous solutions, with porosity of 0,45 µm.

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