

**Fertilizers - Determination of chelating agents -
Determination of iron chelated by EDDHSA by ion
pair chromatography**

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Determination of iron chelated by EDDHSA by ion pair
chromatography

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15451:2008 sisaldab Euroopa standardi EN 15451:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 18.08.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

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This Estonian standard EVS-EN 15451:2008 consists of the English text of the European standard EN 15451:2008.

This standard is ratified with the order of Estonian Centre for Standardisation dated 18.08.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

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English Version

Fertilizers - Determination of chelating agents - Determination of iron chelated by EDDHSA by ion pair chromatography

Engrais - Dosage des agents chélatants - Dosage du fer chélaté par EDDHSA par chromatographie d'appariement d'ions

Düngemittel - Bestimmung von Chelatbildnern - Bestimmung von Eisen-chelatisiertem EDDHSA mit Ionen-Paarchromatographie

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Foreword

This document (EN 15451:2008) 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of an identical text or by endorsement, at the latest by January 2009, and conflicting national standards shall be withdrawn at the latest by January 2009.

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 CEN/TS 15451:2006.

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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1 Scope

This European Standard specifies a method for the chromatographic determination of the total amount of iron chelated by EDDHSA in commercial products.

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 iron chelates are determined by ion-pair high-performance liquid chromatography. When an iron chelate (anion) is added to a polar fluid (eluent), containing a large cation (ion-pair reagent), an ion pair is formed. This ion pair is retained by an apolar solid phase (stationary phase). The strength of the retention depends on the molecular size and its acidity. Each iron chelate presents a characteristic retention time and a characteristic spectrum depending on the chelating agent, and it is separated from the other substances present in the sample. The separation is carried out on a reverse phase silica column and an aqueous solution of TBA⁺ (tetrabutylammonium) and acetonitrile as eluent. The detection is based on photometry at 480 nm. For Fe³⁺/EDDHSA a gradient method is required.

4 Interferences

No interferences have been detected. Iron chelates with o,o-EDDHA, o,p-EDDHA, o,o-EDDHMA, EDTA, DTPA, CDTA, HEDTA, as well as the chelating agents do not interfere since they are separated from Fe³⁺/EDDHSA.

5 Reagents

5.1 General

- All reagents shall be of recognized analytical grade.
- All water used for the preparation of eluent, standards, and sample solutions should be water grade 1 according to EN ISO 3696:1995.
- When reagents with a declared purity of less than 99 % are used for the preparation of standard solutions, a correction should be made in order to obtain the required concentration in the solution.

5.2 Sodium hydroxide solution, $c(\text{NaOH}) = 0,5 \text{ mol/l}$

Dissolve 20 g of NaOH in pellet form in a 1 litre-volumetric flask with water free of carbon dioxide. Dilute to the mark and homogenize.

5.3 Sodium hydroxide solution, $c(\text{NaOH}) = 0,1 \text{ mol/l}$

Dissolve 4 g of NaOH in pellet form in a 1 litre volumetric flask with water free of carbon dioxide. Dilute to the mark and homogenize.