

ICS 65.080

English Version

Inorganic micronutrient fertilizers - Determination of the
chelated micronutrient content and the chelated fraction
of micronutrients - Part 2: Determination of EDTA, DTPA,
HEEDTA, IDHA or EDDS

Engrais inorganiques à base d'oligo-éléments -
Détermination de la teneur en oligo-éléments chélatés
et de la fraction chélatée des oligo-éléments - Partie 2 :
Dosage de l'EDTA, du DTPA, du HEEDTA, de l'IDHA ou
de l'EDDS

Anorganische Spurennährstoffdüngemittel -
Bestimmung des Gehaltes an chelatisierten
Spurennährstoffen und des chelatisierten Anteils an
Spurennährstoffen - Teil 2: Bestimmung von EDTA,
DTPA, HEEDTA, IDHA oder EDDS

This Technical Specification (CEN/TS) was approved by CEN on 21 February 2022 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	3
Introduction	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Principle	6
5 Interferences	6
6 Reagents	6
7 Apparatus.....	7
8 Sampling and sample preparation.....	7
9 Procedure	7
9.1 General.....	7
9.2 Water-soluble micronutrient content.....	7
9.3 Chelating agent content.....	7
10 Expression of results.....	8
10.1 Water-soluble micronutrient content.....	8
10.2 Chelating agent content.....	8
10.3 Chelated fraction (ChF).....	9
11 Test report.....	9
Annex A (informative) Complete names of chelating agents	10
Bibliography.....	11

European foreword

This document (CEN/TS 17786-2:2022) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN.

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 Standardization Request given to CEN by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Micronutrients are considered to be, in plant nutrition, a number of elements known to be needed in small amounts for proper plant growth and development. The most common are Iron (Fe), Manganese (Mn), Molybdenum (Mo), Copper (Cu), Zinc (Zn) and Boron (B).

If an inorganic micronutrient fertilizer contains a substance, or one of the substances in the mixture, which is intended to enhance the long term availability to plants of micronutrients in the EU fertilizing product, that substance is either a chelating agent or a complexing agent.

The chelating agents are divided into two groups¹:

- Group 1: EDTA, DTPA, HEEDTA, IDHA and [S,S]-EDDS;
- Group 2: Chelating agents present in UVCB (unknown or variable composition, complex reaction products and biological materials) chelates including [o,o] EDDHA , [o,p] EDDHA , [o,o] EDDHMA, HBED and EDDHSA.

This document defines the test method to be used in order to measure the compliance with the chelated fraction of micronutrients in product function category (PFC) 1(C) (II) (classified according to Regulation (EU) 2019/1009 [7]) as inorganic micronutrient fertilizer containing one or more chelating agents of Group 1.

¹ Abbreviated terms are described in Annex A.

1 Scope

This document specifies a method for the determination of the chelated fraction of micronutrients for fertilizers containing one or many micronutrients chelated by EDTA, DTPA, HEEDTA, IDHA or [S,S]-EDDS in fertilizers.

This method is used for inorganic micronutrient fertilizers when micronutrients are chelated only by EDTA, DTPA, HEEDTA, IDHA or [S,S]-EDDS or for mixtures in which EDTA, DTPA, HEEDTA, IDHA or [S,S]-EDDS is one of the chelating agents.

The method is applicable to all inorganic micronutrient fertilizers containing EDTA, DTPA, HEEDTA, IDHA or [S,S]-EDDS as chelating agent for contents > 0,1 % (w/w).

The method is based on ICP or AAS measurement of the concentration of micronutrients according to EN 16963 or EN 16965 after water extraction according to EN 16962 and LC measurement of the chelating agents according to EN 15950, EN 13368-1 and EN 13368-3.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 12944-1, *Fertilizers and liming materials — Vocabulary — Part 1: General terms*

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

EN 13368-1, *Fertilizers — Determination of chelating agents in fertilizers by chromatography — Part 1: Determination of EDTA, HEEDTA and DTPA by ion chromatography*

EN 13368-3, *Fertilizers — Determination of chelating agents in fertilizers by chromatography — Part 3: Determination of [S,S]-EDDS by ion pair chromatography*

EN 15950, *Fertilizers — Determination of N-(1,2-dicarboxyethyl)-D,L-aspartic acid (Iminodisuccinic acid, IDHA) using high-performance liquid chromatography (HPLC)*

EN 16962, *Fertilizers — Extraction of water soluble micro-nutrients in fertilizers and removal of organic compounds from fertilizer extracts*

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)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>