

English Version

**Fertilizing products - Determination of the stability of  
fertilizing products containing micronutrient chelates at  
different pHs**

Fertilisants - Détermination de la stabilité des  
fertilisants contenant des oligo-éléments chélatés à  
différents pH

Düngeprodukte - Bestimmung der Stabilität von  
Spurennährstoffchelaten in Düngeprodukten bei  
verschiedenen pH Werten

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

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## European foreword

This document (CEN/TS 17782:2022) 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.

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## 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 micronutrient metals are Iron (Fe), Manganese (Mn), Cobalt (Co), Copper (Cu) and Zinc (Zn).

An EU fertilizing product consists solely of component materials complying with the requirements for one or more of the component material categories (CMCs). CMC 1 corresponds with the virgin material substances and mixtures.

If a micronutrient fertilizing product 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 EU fertilizing products containing chelates remain stable for at least three days in a solution having any pH within the range declared as guaranteeing acceptable stability. Metal chelates can be used in agriculture directly to soils, in nutrient solution in fertirrigation or soilless culture and in solution for foliar application. Tap water is a good model for interaction with chelates since it contains calcium and magnesium that may react chemically with the metal chelates. Composition described for CIPAC (Collaborative International Pesticides Analytical Council) standard tap water D is a good representative of a tap water of medium hardness and will be used in this standard to determine the stability for at least three days of micronutrient chelates at any specific pHs.

This document defines a test method to check the chelate stability in solution, using as a model the interaction in a reference tap water similar to the CIPAC D.

## 1 Scope

This document specifies a method for the determination of the soluble metal that remains in solution at different pHs after the application of a solution of the fertilizer substance containing micronutrient chelates in a tap water solution used as a reference.

The method applies to fertilizing products containing chelated micronutrients.

## 2 Normative references

The following documents are referred 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 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)*

CEN/TS 17786-1, *Inorganic micronutrient fertilizers — Determination of the chelated micronutrient content and the chelated fraction of micronutrients — Part 1: Treatment with a cation exchange resin*

CEN/TS 17786-2, *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*

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 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/>

### 3.1

#### ChSt

#### stability of the metal chelate

micronutrient present in a fertilizer product that is soluble in the reference tap water after three days of interaction at a specific pH, divided by its metal chelated content

Note 1 to entry: ChSt is expressed as a percentage.