



BSI Standards Publication

Organo-mineral fertilizers — Identification of complexing agents

Part 2: Method using high-performance liquid chromatography (HPLC)

National foreword

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The UK participation in its preparation was entrusted to Technical Committee CII/37, Fertilisers and related chemicals.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2022

ISBN 978 0 55 17911 8

ICS 65.080

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 July 2022.

Amendments/corrigenda issued since publication

Date	Text affected
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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN/TS 17784-2

April 2022

ICS 65.080

English Version

Organo-mineral fertilizers - Identification of complexing agents - Part 2: Method using high-performance liquid chromatography (HPLC)

Engrais organo-minéraux - Identification des agents complexants - Partie 2 : Méthode par chromatographie liquide à haute performance (HPLC)

Organisch-mineralische Düngemittel - Identifizierung von Komplexbildnern - Teil 2: Verfahren mittels Hochleistungs-Flüssigkeitschromatographie (HPLC)

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

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

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European foreword

This document (CEN/TS 17784-2:2022) 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.

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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 are Iron (Fe), Manganese (Mn), Molybdenum (Mo), Copper (Cu), Zinc (Zn) and Boron (B).

If an organo-mineral 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 can be either a chelating agent or a complexing agent.

The incorporation of heptagluconic acid as complexing agent in organo-mineral fertilizers is intended to enhance the long term availability to plants of micronutrients in such EU fertilizing products.

1 Scope

This document specifies a chromatographic method which allows the identification of heptagluconic acid (HGA) in organo-mineral fertilizers containing heptagluconic acid metal complexes.

NOTE For the complete names of the chelating agents mentioned in this document, see Annex D.

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*

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

complexing agent

organic substance forming a flat or steric structure with one di- or tri-valent transition metal cation (zinc (Zn), copper (Cu), iron (Fe), manganese (Mn) or cobalt (Co))

4 Principle

The method is based on demetallation with phosphoric acid of the micronutrient HGA complex present in an aqueous solution of the sample.

The complexing agent is then identified and determined by high-performance liquid chromatography.

The separation is carried out on an NH₂ phase bonded to silica column and an aqueous solution of phosphoric acid and acetonitrile as eluent.

The detection is based on UV photometry at 210 nm.

WARNING — Users of this document should be familiar with normal laboratory practice. This document 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 document are carried out by suitably trained staff.

5 Interferences

Current knowledge on eventual interferences from other substances is summarized in the list below: