



BSI Standards Publication

Organo-mineral fertilizers — Identification of complexing agents

Part 1: Method using UV-Vis spectrophotometry and gravimetry

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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Organo-mineral fertilizers - Identification of complexing agents - Part 1: Method using UV-Vis spectrophotometry and gravimetry

Engrais organo-minéraux - Identification des agents complexants - Partie 1 : Méthode utilisant la spectrophotométrie UV-Vis et la gravimétrie

Organisch-mineralische Düngemittel - Identifizierung von Komplexbildnern - Teil 1: Verfahren mittels UV/VIS-Spektralphotometrie und Gravimetrie

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European foreword

This document (CEN/TS 17784-1:2022) 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 lignosulfonates as complexing agents 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 two methods required for the identification of lignosulfonate by UV-Vis spectrophotometry (method A) and gravimetry (method B) in organo-mineral fertilizers.

NOTE Lignosulfonate, as a complexing agent, is a natural polymer produced as a by-product of the sulfite method for manufacturing paper from wood pulp in the paper industry. As a natural polymer, it presents a poorly defined and variable chemical structure. It is an intricate mixture of small- to moderate-sized polymeric compounds with sulfonate groups attached to the molecule, and diverse complexing capacity.

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 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

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 Sampling and sample preparation

Sampling and sample preparation are not part of the method specified in this document.

Recommended sampling methods are given in EN 1482-1 and, for sample preparation, in EN 1482-2.

5 Method A: Determination of phenolic hydroxyl content and 232,5 nm absorbance for the identification of lignosulfonates

5.1 Principle

The method for the determination of the phenolic hydroxyl content is based on the ultraviolet absorption of phenols in alkaline solution (phenolate). The absorbance of an alkaline solution of the sample is measured directly against an acid solution of the same sample. The phenolic hydroxyl content of the sample is calculated from the molar extinction coefficient maximum of the resulting curve and the molar extinction coefficient of reference compounds determined in the same way.