

Inorganic fertilizers - Determination of methylen-urea oligomers using high-performance liquid chromatography (HPLC)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**Inorganic fertilizers - Determination of methylen-urea
oligomers using high-performance liquid chromatography
(HPLC)**

Engrais inorganiques - Dosage des oligomères de
méthylène-urée par chromatographie liquide haute
performance (HPLC)

Anorganische Düngemittel - Bestimmung von
Methylenharnstoff-Oligomeren mittels
Hochleistungsflüssigkeitschromatographie (HPLC)

This European Standard was approved by CEN on 27 November 2023.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 10 January 2024.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 15705:2023) 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of an identical text or by endorsement, at the latest by June 2024, and conflicting national standards shall be withdrawn at the latest by June 2024.

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, together with EN 17864:2023, supersedes EN 15705:2010.

In comparison with EN 15705:2010, the following technical modifications have been made:

- EN 15705:2010 is split into two documents:
 - Method A of EN 15705:2010 is given in EN 17864:2023;
 - Method B of EN 15705:2010 is given in this document.

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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1 Scope

This document specifies a method for the determination of methylen-urea (MU) oligomers in inorganic fertilizers using high-performance liquid chromatography (HPLC).

The method is applicable to all fertilizers which do not contain interfering organic compounds.

NOTE By the condensation of urea and formaldehyde, several oligomers are formed, such as methylen-diurea (MDU), dimethylen-triurea (DMTU), trimethylen-tetraurea (TMTU) and higher oligomers. The three molecules named here are the most soluble in water, while the higher compounds are insoluble in hot water, but their nitrogen is available for plants by microbiological decomposition. Also, urea is always a companion of MU-oligomers.

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 1482-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

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 apply.

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

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

4 Principle

The sample is extracted with boiling water and analysed using a suitable HPLC system.

The methylen-urea soluble oligomers are measured and detected by the HPLC-method.

In the chromatogram methylen-urea oligomers are represented by different peaks: urea, methylen-diurea, dimethylen-triurea, trimethylen-tetraurea are, in the meantime, the most soluble and important.

5 Reagents

Use only reagents of recognized analytical grade and distilled or demineralized water, free from carbon dioxide and all nitrogenous compounds and having an electric conductivity < 0,5 mS/m.

5.1 Acetonitrile, HPLC-grade.

5.2 Urea, p.a., mass fraction of 46,6 % of total nitrogen.